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Riemer, W. J.

1947-1954

Species Accounts

Amphibians:

Salamanders

Frogs

Salamanders

W. Riemer
1953

Ambystoma sp.

29 June Mexico: Chihuahua: 7 mi. SW El Vergel (Lagunita), 7800 ft.

7 larvae, 5-9 cm in total length taken in small stream in pine forest. Colors in life: Yellowish green with black mottling. Underside ~~black~~ with yellow to salmon iridescence. Gills yellow-green. All were taken in water 1-12 inches deep. Showed marked tendency to hid under rocks in water with any disturbance, usually seemed to remain a very edge of rock but frequently noted exposed on bottom mud but always near rocks. Wary.

8 July Mexico: Durango: 6 mi. WSW Las Adjuntas, 8500 ft.

Series of 7 small larvae taken from small stream flowing by a series of small shallow pools through a meadow in pine-oak forest. Series of 5 large larvae including one essentially post-larval individual taken after dark by hand from algae grown, spring-fed pool on slope several hundred feet from stream and at least 100 ft. above stream. This is evidence that adults are at least occasionally terrestrial. Colors in life of large series of larvae: Dorsum blackish brown with lemon yellow spots and markings. Venter silvery yellow. Younger larvae from stream appear darker and less grossly ~~marked~~ patterned.

W. Riemer
1952

Ambystoma macrodactylum

31 May Calif.: Plumas Co., 0.6 mi. SSW Greenville

In stagnant pool at edge of stream saw large numbers of larvae of this species and Hyla(?) tadpoles, all small. Water temp. 1200 hours, 21° C. Larvae tend to hide among small rocks on bottom, under leaves, come to surface periodically, cling to vertical exposed rock surfaces. Easily distinguished from Triturus by more extensive dorsal fin and larger plumey gills. Only fore limbs present. Darkly pigmented.

W. Riemer
1949

Ambystoma tigrinum

28 July Arizona, Coconino Co., 8 mi. SSW Flagstaff, U.S. Alt. Hwy 89
Series of five taken from permanent pond built for fishing. Occur in considerable numbers in pool. Water lilies, green surface algae present. Bass and bluegill said to be present also.
#397, adult terrestrial form, colors in life; venter pale blackish transparent purple in darker areas. Dorsum deep olive brown with diffuse gold mottling. Iris pale gold with overlying ~~dark~~ deep red.
#398, adult size larval form, colors in life; venter lemon yellow with gold luster except tail and throat. Dorsum dark olive green. Spots black. Iris copper.

29 July Arizona, Navajo Co., Pinetop, State Hwy 173, 7315 ft.
In pond just at NW edge of town found species common in larval form. Most discovered as they headed for deep water toward center. Swim with almost fish like rapidity. Apparently most lying on bottom under floating greenish scum-like algae. Many with dorsal color similar to algae and therefore difficult to spot. Is this protective coloration?
R. pipiens, B. woodhousii(?) and T. elegans also present.

W. Reimer
1949

Ambystoma Tigrinum

29 July Arizona, Navajo Co., Pinetop, State Hwy 173, 7315 ft.
#406, adult-size larva, colors in life; venter pale greenish white, ~~greenish~~ olive green, dark gray spotting dorsally. Yellow spots along lateral line with a few just above. Tail fins dark, dark gray on posterior half of dorsal fin, ventral fin blackish throughout. Vessels in gills coated with blue-green-silvery pigment. Iris gold.
#407, adult-size larva, colors in life; venter pale golden-green-white, ground color dorsally greenish olive, vessels in gills covered with silvery yellow green. Only tail tip and posterior half ventral fin margin dark gray. Otherwise same as #406.

W. Reimer 1953 **Ambystoma tigrinum**

13 Nov. Calif.: Contra Costa Co.

A single individual taken 1 mi NE Walnut Creek. This extremely large individual taken during heavy rain at 2100 hrs. When first spotted at very edge of pavement it appeared like a rapidly writhing, very stubby or partially coiled snake. In the headlights only the light spots can be easily seen and since these are small the black animal is easily overlooked unless moving.* The large animal has surprizingly few dorsal spots as compared with the smaller individuals from the locality below. Is there a decrease in spotting with age? a geographic variation? a wide inherent variation? A series of 6 collected on Vasco Rd. along Kellogg Creek, 3 mi. W, ½ mi. S Byron. Again these animals were difficult to spot on the black road surface except when moving rapidly. Best driving speed appeared to be about 10 mi. per hour for collecting. This terrain of low, rolling, grass covered hills at very edge of Central Valley. An occassional oak is present. Most or all of land is grazed.

*Terrain here is grass (?) ilkoat covered hill (near base) on outskirts of town.

Although most of roadway along Marsh Creek and Kellogg Creek to Livermore was examined at speeds greater than 10 mph (15-30 mph) no appreciably

W. Riemer 1953 — **Ambystoma tigrinum**

13 Nov. Calif.: Contra Costa Co.

number or local abundance of salamanders would have been completely missed. The Walnut Creek animal was taken from the edge of the broad valley in which that town lies. The others were apparently present only on the lowest, flattest portion of Vasco Rd. The animal appears not to be present then on the higher ground or in hill areas.

All the animals are alike in displaying a blackish brown dorsal ground color with light spots of a pale ~~silvery~~ silvery yellow or pale lemon yellow. The spots are distributed randomly over the dorsum and sides of the tail, may be almost ~~eq~~ circular like poka-dots or somewhat elongate transversely like incipient bands or bars. The upper limbs dorsally have at least a single normal sized light spot or may be extensively light pigmented. Dorsal (as well as ventral) surfaces of feet are largely light. The Walnut Creek animal differs in having only a single definite dorsal trunk spot, a single dorsal head spot and a broken longitudinal stripe laterally on tail. Is this of geographic or age significance? Ventrolaterally the dorsal ground color is bordered by a more or less continuous broad stripe of light pigment extending from axilla to groin. The gular region and belly are essentially a uniform pinkish lavender without marking except in the Walnut Creek

W. Riemer 1953 — *Ambystoma tigrinum*

13 Nov. Calif.: Contra Costa Co.

animal which has a grossly mottled or highly broken ventro-lateral light stripe, a similarly grossly mottled gular and belly region with the light yellow bars extending nearly and even completely across*. Further, the belly is basically brownish lavender rather than punkish. Iris color of all a rich dark reddish gold.

* The most boldly patterned of the Kellogg Creek series also has spots of light on the gular area and several large light spots on the chest.

3 Dec. Calif.: Contra Costa Co.

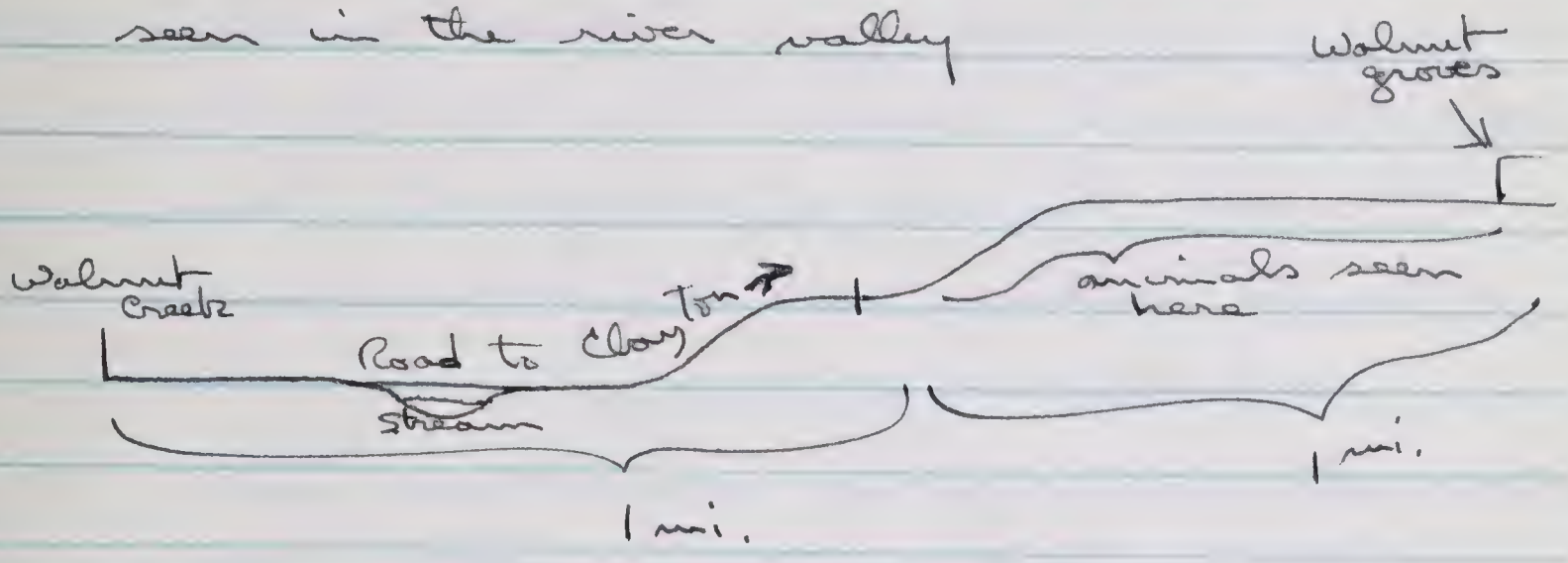
About 4 DOR specimens seen on road between 1 and 2 miles NE of Walnut Creek All of these badly crushed except for one with merely a crushed head which was saved. One additional animal taken alive on road up on slope of Mt. Diablo 1 mi. S, 1½ mi. W Mt Diablo, 1750 ft. Catalogued by S.F. Cook, Jr. On slope of Diablo terrain appeared to be largely grassland, steep with some brush in ravines and scattered oaks. This picture not necessarily accurate in that night very dark and raining. Fog closed in immediately above this point which is about 2/10 ths mi below road to (?) Turtle Creek Ranch and about 1 mi. below state Park entrance gate. NE of Walnut Creek animals present, seemingly

W. Riemer
1953

Ambystoma tigrinum

3 Dec. Calif.: Contra Costa Co.

only on top of an extensive flat area above the river. None have been seen in the river valley



close to town and none in cultivated walnut orchards, the latter having been closely examined on two occasions. Region where found, ~~has~~ has, according to "Concord" topo sheet several ponds or impoundments. None are shown for areas W of Walnut Creek. Is this reason for no ~~Tigrina~~ Ambystoma being present W of town? Night of 3 Dec with considerable heavy rain from 1730 hrs to 2230 hrs at which time sky rapidly cleared. No cold during rain.

W. Reiner
1952

Aneides ferreus

5 Feb. Calif.: Del Norte Co. 2¼ mi. S, 2¼ mi. E, Fort Dick

large adult under bark (~~abac~~ where damp) of large (3 feet in diameter) upright dead tree in open sunny cut-over clearing. Numerous stumps and logs about. See Gerrhonotus account – taken 4 feet away. Taken about 2 feet above ground on transition between sunny and shaded side of tree.

large adult under bark of redwood stump at base. About 2 feet from Hyla – see that account. Wet under bark, on sunny side of stump.

Another under bark of same redwood stump but this time shaded by small shrub. Hyla 2 inches away.

juvenile at base of same redwood stump but on shady side. Bark damp next to wood.

Subadult under sunny side of bark on stump. Same sort of situation as above.

W. Reimer
1949

Aneides flavipunctatus

27 Nov. Calif.: Santa Clara Co., Campbell Cr., Saratoga
Half-grown animal taken under board on thick broadleaf litter 25 ft. from stream. Soil wet. Sycamore, alder(?) cover overhead.
Another half-grown animal taken on clean, wet soil under board 25 ft. from stream and halfway up 6 ft road bank. Good thick leaf mat about. 6 ft. from site of capture of previous animal. On exposure retreated immediately under flat rock also lying under board.
Large adult under board on leaf and rocky-sand substrate. 15 ft. from stream. Immediate attempt at escape. Considerable time spent searching in areas not immediately adjacent to stream. No Aneides found in such spots.

8 Dec. Calif.: Santa Clara Co., Los Gatos A small pond on the "Vandenburgh Place" at the end of Madrone Ave. Single juvenile taken under board right in tiny trickle of water feeding pond and about 6 in. from edge of pond.

8 Dec. Calif.: Santa Clara Co., Saratoga Single subadult with very warty skin taken under rock in seep from spring at

W. Riemer
1949

Aneides flavipunctatus

8 Dec. Calif.: Santa Clara Co., Saratoga base of earth bank. Seep area full of dead Equisetum. Soil black and rotten smelling in seep. Could it be that wartiness is due to a chemical constituent of water or soil? Could the "foulness" of habitat so affect animal?

W. Riemer
1952

Aneides flavipunctatus

3 Feb. Calif.: Mendocino Co., Robinson Creek, 4 mi. S, 1½ mi. W Ukiah

One adult in crevice of rotten fractured rocks under live oak shrub. 15 feet from stream and 10 feet above stream bed. Level ground. Rocks damp, in shade. Little soil between rocks. Grass, dead oak leaves and limbs surrounding spot.

One subadult under rock resting on dead wet leaves and soil 20 feet from previous spot. Not protected from sun though none shining at the time.

One juvenile in rock rubble at edge of stream. Greenish-gold stippling on back.

One subadult few feet away from previous spot in rubble also. Batrachoseps also present.

All of the above taken between 1030-1100 hrs. Weather bright but with overcast, no shadows. Ground and grass wet.

4 Feb. Calif.: Humboldt Co., 5.6 mi. N Garberville

Subadult on wet clean soil under small fist-sized rock near base of north-facing, open, rocky slope. No protecting vegetation in immediate vicinity. Small tributary stream 50 feet away, 4-6 feet broad. Few conifers, several broadleaves around. Weather: grey overcast, 0800 hrs.

W. Reimer
1952

Arneides flavipunctatus

4 Feb. Calif.: Humboldt Co., 5.6 mi. N Garberville

large adult in cavity under 10 inch square rock lying on rock and soil. Soil clean. 15 feet to stream. large low pile of rocks well-~~covered~~ covered with moss. Typical habitat according to Stebbins, ie. rock rubble next to small stream.

large adult, same situation as above but cavity in soil not apparent. 8 feet distant from above.

Subadult under rock on rocky, broadleaf-covered, south-facing slope 15 feet above a boiling brook but at edge of hillside seep. This also typical according to Stebbins.

large adult in cavity in clean soil under flat 18 x 12 inch rock on rocky grass covered shelf 50 feet above stream. Still grey overcast at 0840 hrs. Soil wet.

large adult in burrow under rock in rocky rubble at base of bank at rear edge of shelf in previous account. Rocks, moss and leaf covered.

large adult in cavity under narrow board on narrow shelf 100 feet or more above stream on south-facing slope. Thick mat of dead oak leaves. Soil wet. tugubris under same board.

large adult in same situation as one just below midpage.

W. Riemer
1949

Amaides lugubris

18 Dec. Calif.: Marin Co., 3 mi. W, 1 mi. N Las Gallinas

Single juvenile taken at edge of roadway under dead stump. I. torosus taken few feet away.

W. Riemer
1952

Aneides lugubris

3 Feb. Calif.: Mendocino Co., Robinson Creek, 4 mi. S, 1½ mi. W Ukiah

One large lugubris deep in hole where rotten stump pulled out. On ridge with open stand of small oaks and manzanita

3 Feb. Calif.: Mendocino Co., 9.4 mi. SSE Willets

One large adult in hollow log lying at base of road embankment. Hollow largely filled with Neotoma-chewed Umbellularia fruits. Adjacent level shelf with numerous Umbellularia bordering stream.

One subadult under loose bark of log on bank above stream. Open bay-oak-madrone forest.

One large adult (with scar on cheek) in rotten-log on slight slope near river. Much leaf litter. Open oak-bay forest. Wet inside log.

4/8 juveniles under semi-loose bark of log 20 feet from stream on level shelf. Bay and madrone in vicinity.

1 subadult under same log as above on sandy soil.

2 adults under bark of dead upright tree on level bank adjacent to, but above stream. 20 feet from stream. One at very base of tree, other 1 ft. above ground. Scelopous also under bark. Woodpeckers recently working upper parts of tree 10 feet above ground.

~~1 large adult~~

W. Riemer
1952
1953

Aneides lugubris

4 Feb. Calif.: Humboldt Co. 5.6 mi. N Garberville

Large adult with A. flavipunctatus. See that account. Grey overcast at 0900 hrs.
Large adult under loose board on earth - moss - leaf - and grass covered abandoned wooden bridge. Substrate mixture of soil and rotted wood.
Juvenile in same situation as above.

1 Feb. Calif.: Napa Co., 9.3 mi. NNW Monticello

1 large adult in damp earth at edge of large, dead, half-~~buried~~ buried oak log. Log under large oak. In flat oak woodland of large widely scattered oaks. Open oak woodland of small oaks on adjacent hills. Grass short, well grazed. Millipeds (large) also present. Another large adult taken under similar circumstances on open hilly knoll. Protecting tree dead and burnt.

23 Mar. Calif.: Calaveras Co., ~~Angels~~ 2½ mi. N, 3½ mi. E Murphy's

5 Aneides lugubris taken here in yellow pine, incense cedar forest. Subadults and adults. Associated are Ensatina eschscholtzii xanthoptica. large quantities of well rotten logs. little understory except for a low dense ground cover of a mimosa-like plant.

1 May Calif.: Eldorado Co., Webber Creek

3 adults taken in two wet, rotten logs. Yellow pine-oak forest. Recent rains have soaked ground even under large rocks. No spotting at all on these animals. No obvious eye patch.

W. Riemer 1953 Arneides lugubris

13 Nov. Calif.: ~~Contra Costa Co.~~ Alameda Co.

A series of about 6 taken on the Vasco Rd at 1 mi. S of Alameda - Contra Costa Co. line, 1½ mi N, 4 mi. W Altamont. Here, near summit of a ridge running approximately E toward the Central Valley terrain hilly or low mountainous and covered with (it seemed) ~~chaparral~~ chaparral. Trees may also have been present. Taken during light rain following heavy precipitation. Difficult to see from car unless moving.

13 Nov. Calif.: Contra Costa Co.

Single large adult taken on road during light rain at 2430 hrs. 1 mi N, 4 mi. E San Ramon on Tassajara Rd. Two smaller animals from 2 mi. N, 2 mi. E San Ramon on Tassajara Rd. Here, terrain of rolling hills, grass-covered, heavily grazed. ~~Ea~~ Few if any trees about.

Due to the speed at which we were driving while examining other portions of the road this species, because of its obscurity against the road surface, may have been passed up. It is reasonably certain however that no concentrations of them were overlooked.

3 Dec. Calif.: Contra Costa Co.

5 picked up on rainy night on road ½ mi. S, 2 mi. W Mt. Diablo. All kept by Cook, Jan

W. Riemer
1951

Batrachoseps attenuatus

13 July Calif.: Monterey Co., Asilomar

Dr. Willard Hartman took me to spot on beach where he found, but did not collect, two animals of this species yesterday while searching for arachnids. On returning today we discovered but a single one in a very short search. The particular niche is a very wet seep at the point of contact between a low (6 foot) sandy clay bluff and the ocean sand. Typical terrestrial vegetation extended oceanward as scattered plants perhaps 4-6 feet from edge of bluff. Forms present: a yellow Potentilla (?), a maritime Cruciferae, some grasses and mesembryanthemums. The soil was very largely sand with a quantity of organic material sufficient to make it mud colored. Much of the exposed wet area was covered with a rust colored slimy growth. Reddish amphipods (beach hoppers) were abundant. Hartman felt sure the spot fell within the upper reaches of the splash zone. The beach was sandy, without rocks and thus with probably little splash. Dorsally the animal had a bright brick red stripe ~~somewhat~~ somewhat more reddish than I remember seeing in East Bay animals.

W. Riemer
1952

Batrachoseps attenuatus

3 Feb. Calif.: Mendocino Co. Robinson Creek, 4 mi. S, 1½ mi. W Ukiah

One large adult taken at edge of stream under rock with Aneides flavipunctatus in loose rock rubble.

Two under small (3 inches in diameter) log on steep bank above small tributary rivulet. Both under rotten log.

Weather: see A. flavipunctatus

4 Feb. Calif.: Humboldt Co. 5.6 mi. N Garberville

2 under rocks as described under Aneides flavipunctatus. Smaller rocks on fractured rock rubble.

1 under rock rubble at base of bank on shelf 50 feet above stream. A. flavipunctatus common. Different than above animal in that vertebral stripe brick red. Stebbins says tend to get redder northward. Soil saturated.

5 Feb. Calif.: Del Norte Co. 2¼ mi. S, 2¼ mi. E, Fort Dick

Subadult under mashed redwood fragment in clearing.. See Gerrhonotus account.

Large adult with reddish stripe under bark of small log at edge of meadow. See Ensatina

3 large adults under rotten log section in same sort of situation as previous one.

2 adults and 1 subadult under chunk of wood with Ensatina.

5 Feb. Oregon: Curry Co., 11.2 mi. S Carpenterville

One adult, 3 feet from stream, see P. dunnii for environment. Taken in dunnii type spot.

W. Riemer
1952

Batrachoseps attenuatus

13 Feb. Calif.: San Mateo Co., 2½ mi. W San Bruno

Specimens from here are large, abundant and with light underside to tail as in pacificus but unlike pacificus there are guanophores present on the underside of the tail. Most attenuatus with underside of tail dark and always with guanophores according to Zweifel. Two captured here as examples.

W. Riemer
1950

Bolitoglossa

26 Mar. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.
6 small specimens taken under bark of log 2 ft. in diameter. Bark ½ to 1 in. thick and not adhering tightly to log where salamanders found. Log of pine. Wood with hard surface without fissures but wet to extent that water squeezed out with considerable pressure. Slimy film over parts of wood with white fungi present and some earth-like organic material also present under wet bark. Most of log resting on ground but at least one specimen a point where log not in contact with ground. Log on W-facing slope and perpendicular to slope but salamanders only found where log shaded or semi shade at that time of day, 1430 hr. Taken on dorsal, dorso-lateral and lateral surfaces of log always clinging to log, not bark. 4 on shady side of log, one on sunny, though spot well shaded. Temp. under bark (undisturbed) immediately adjacent to where salamanders taken 25.2, 25.6, 22.4, 22.4, 22.6, 25.8° C. 3 specimens within radius of 10 in. Also present under bark: earthworms, fast moving earwig-like animal, Tenebrio-like larvae, various small insects. One small dried specimen found on surface of bark apparently dessicated while trying to move during day to new spot. Note especially high temp. under bark which animals seek and fact that wood not rotten and not fissures present.

W. Reiner
1950

Bolitoglossa

26 Mar. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.
One small specimen taken under tight bark of dead 5 ft. stump. Wood hard and damp. Specimen 3 ft. above ground clinging to vertical wood surface. Fell away when exposed.
One large specimen # 656 taken near center of rotten stump. Center damp but not wet enough to squeeze water from. Wood 25.4° C.
Two specimens, one large # 657 and one small taken in rotten stump on N-facing slope just below ridge. About ½ of wood rotten enough to pull away by hand. Wet enough to squeeze a little water. Part of log decomposed to earthy-like material or maybe feces of an insect. Scolopens also taken under bark of this stump. Dry under bark.

29 Mar. Two salamanders, one subadult (?) and one very small one taken under piece of log 2 in. thick on upper side of fallen, rotten log. Log lichen and moss covered. Near ridge of NW-facing slope. Wood wet enough from which one could squeeze water. Wood, 12.4° C. Another salamander taken under bark of fallen log about 2 ft. off of ground. NW-facing slope. 13.0° C. Fungus and earthy insect feces abundant under bark. Not wet.

30 Mar. Three hours of pulling bromeliads apart produced a single specimen from a plant 10 ft above ground on a lateral branch of a broadleaf

W. Reiner
1950

Bolitoglossa

30 Mar. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.:
6 in. diameter
tree ∧ which contained many bromeliads. This
particular bromeliad one of a cluster
of about eight. Invertebrates very abundant
in bromeliads and all contained some
water, sometimes a good deal of water.
Animal appears to be same species as those
taken in logs during past few days.

1 Apr. Specimen taken under bark of vertical
stump in cleared area with only shrubs
and grasses present Also under bark of same
stump a few inches away was a Sceloporus.
Bark loose, wet beneath and temp. underneath
bark 16.2° C. Several very rotten and
wet logs torn apart in small patch of
flush jungle-like growth at edge of cleared
area but no salamanders found. Are they
confined to relatively open sunny places.

4 Apr. These animals noted on several occasions to
~~prefer~~ rather exposed logs and stumps; at least
none have been found in such places where
logs or stumps well shaded as in the denser
woods. Is this because they can enjoy a
fairly warm temperature (which they seem to
tolerate – see above) and yet get sufficient
moisture from the daily very ∧ humid evenings.
In the denser protected areas such warm
daytime temperatures would not be possible.

N. Reimer
1954

~~Taricha~~ Taricha pyrrogaster

4 Feb. M.V.Z.

I have had an individual of this species in the courtyard pool of H.S.B. for several years. On being stimulated it assumed a defensive posture like this:

The body is not flexed so that the head tends to curl back to touch the dorsal portion of the tail base as in Taricha but rather curves in part sideways causing the dorsum only to be visible from one aspect and the underside of the tail and throat plus a portion of the trunk to be visible from the opposite aspect. The tail is tightly curled its entire length. The limbs are not extended as rigid sticks as in Taricha

Superficial examination of the vomeropalatine teeth suggest them to form a ∧ pattern as in T. granulosa

W. Reimer
1951

Dicamptodon ensatus

12 Aug. Calif.: Marin Co., 1½ mi SSE Alpine Lake Dam. Cataract Canyon. 4 larvae of this species taken with net in deep pool. Stream not flowing but water cool, clear, deep, abundant. Also present were adult R. boylii in considerable numbers but no Triturus. Does presence of Dicamptodon preclude presence of Triturus?

Body lengths: 45, 45, 40, 36 mm.
Total lengths: 85, 83, 80, 71 mm.

18 Aug Calif.: Sonoma Co. Skaggs Springs, Warm Springs Cr. 1 mi. W, ½ mi. N

Three larvae and one almost completely metamorphosed young taken in pools in rivulet feeding main stream. Post-larval individual under rock at edge of stream.

19 Aug Calif.: Mendocino Co., Van Damme State Park, 2 mi. S, 2½ mi. E Mendocino 1

larvae of all sizes are present including post-larval young. All tend to stay under rocks in shallow water. Almost every rock turned sheltered one or more individuals. Are Triturus excluded by this species?

W. Riemer
1952

Dicamptodon ensatus

8 Feb. Calif.: Humboldt Co., 1 mi. SE Big Lagoon, tributary of Maple Creek.
3 inch larva taken on sandy, rocky bottom of portion of stream described under Rhyacotriton. Moderate flow at point of capture. Smaller individual seen in protected side pool under overhanging bank. Was under small rock on sandy bottom.

W. Riemer
1954

Dicamptodon ensatus

5 May Calif: Santa Cruz Co., Big Creek, Swanton

Single large but very immaciated adult of light coloration taken from edge of spring-fed (?) concrete tank built flush with ground level. Animal perched on board which ~~frame~~ formed overflow drain floor. Redwood forest. Stream 100 ft. away. Nothing else seen in water of tank. Larvae common in pools of tributary rivulets of main creek.

W. Rieman
1952

Ensatina eschscholtzii

3 Feb. Calif.: Mendocino Co., 3.1 mi. S Laytonville

1 adult under metal auto hood on ground in semi-open bay ∓ Douglas fir — madrone forest. On level bank above and 15 feet from stream.

5 Feb. Calif.: Del Norte Co. 2¼ mi. S, 2¼ mi. E Fort Dick

large picta under wet fragment of mashed log in sunny open clearing. 4 feet from A. ferreus and Gerrhonotus. See Gerrhonotus account. Subadult and adult picta under fence post on ground in meadow near edge of madrone-tanbark oak, Doug. fir forest. Meadow pond 10 feet away. Clear, sunny, warm. Dead grass only slightly damp under board. Grass 2-3 inches high. About 100 feet from P. elongatus site.
Adult under chunk of wood in shade at edge of meadow as in previous case. 3 Batrachoseps also present.

13 Feb. Calif.: San Mateo Co., 2 mi. S Woodside

large adult — not good xanthoptica — on open broadleaf littered slope in young redwood-broadleaf forest. Under moss covered rock. little cover except rocks and scattered burned fragments of logs.

W. Riemer
1953

Ensatina eschscholtzii

3 Dec. Calif.: Contra Costa Co.

Single small specimen taken on road immediately below fog zone ~~on~~ 1 mi. S, 1½ mi. W Mt. Diablo, 1750 ft. Catalogued by S. F. Cook, Jr. Ambystoma taken only a few tenths of a mile down slope. ~~This eastern most record~~? Stebbins 1949 records species from several spots on Mt. Diablo.

W. Riemer
1948

Ensatina sierrae

Tenaya Canyon, 1.1 mi. above Miror Lake, 4250 ft., Mariposa Co., Calif.

2 July Single individual, #87, taken under large piece of bark lying at foot of rock precipice. Animals head only showing from rodent(?) burrow under bark. Escape attempted immediately. Soil under bark, damp. Exposed soil dry and dusty covered with needles and leaf litter. During several days of looking this is only salamander uncovered.

W. Reimer
1952

Plethodon dunni

5 Feb. Oregon: Curry Co., 11.2 mi. S Carpenterville

Plethodon elongatus

Under rock of rocky, mossy, ferny slope of road embankment where stream of cascading type 15 feet away. Juvenile with brick stripe, chin black with white spots unlike light chin of elongatus young. Injured in capture. Steep, mossy canyon with many ferns. Stream about 3 feet wide, boiling down in series of small 3-4 foot waterfalls. Weather, clear, cool, sunny but canyon entirely shaded. Soil damp. 1415 hrs.

Juvenile in same sort of situation as above except in loose rocky soil 2 feet above stream. Greenish-gold stripe.

Large juvenile in moss covered rock pile at edge (3 feet away) of stream. Otherwise as above. Stripe greenish gold.

W. Riemer
1952

Plethodon dunni ~~echiembumo~~

7 Feb. Oregon: Coos Co., 2.6 mi. SW Coquille

Subadult with yellow-green stripe under almost vertical rock slab against rocky, muddy bank at edge of seep described for Rhyacotriton and about 3 feet from capture site of that (the 1st) Rhyacotriton. Soil saturated.

2, 1 large adult, one subadult in crevice behind a large 12X12 inch rock pulled from base of bank in seep stream bed. Few inches from above animal. Soil in crevice, clear and saturated. Rocky soft and sandy.

Large adult in midst of stream under small rocks. Attempted to burrow into rock and mud to escape. A perfect spot for Rhyacotriton.

Adult among rocks at edge of seep. Soil saturated. Again a Rhyacotriton sort of site.

7 Feb. Oregon: Curry Co., 7.5 mi. N Pistol River (town)

Large adult in seep area entering stream. Moss layer over course gravel & mud. See Rhyacotriton for environment. Stream temp. 1645 hrs. 9°C.

W. Riemer
1952

Plethodon elongatus

5 Feb. Calif.: Del Norte Co., 2¼ mi. N, 6½ mi. E Crescent City

Large adult under rock on levelish spot on steep bank 200 feet above Smith River. Substrate of soil and humus. Rock 6X8 inches. Numerous other moss covered rocks nearby. Dense rather small but tall broadleaf trees on slope. Ferns common. 0830 hrs. Weather: clear, cold, sunny but sun confined to opposite shore of river. 7½° C. 1 ft. above ground.

Large adult under same conditions as given above in same rock area.

Small adult in center of short section well-rotted log well-covered with lichens and moss. Same otherwise as above.

Large adult under bark of ~~on~~ prostrate burned stump. Animal on lower side of stump next to ground. Soil damp, not wet. Same otherwise as above.

5 Feb. Calif.: Del Norte Co. 2¼ mi. S, 2¼ mi. E Fort Dick

Two, one large adult, one subadult in soil and rotten wood at base of stump almost hidden by understory growth. At edge of clearing described under Gerhonotus. Well shaded, damp - not wet.

1 juvenile under moss covered rock of a pile 20 feet from above captures. Is presence of rock necessary? Stebbins say he never before found them except in rocks.

W. Riemer
1952

Plethodon elongatus

5 Feb. Calif.: Del Norte Co. 2¼ mi. S, 2¼ mi. E Fort Dick

Large adult in cavity under rock. Many around, moss ~~cover~~ covered. Well shaded spot, 6 ft from where juvenile above taken. Young redwoods and tanbark oak form good canopy overhead. Soil damp.

Subadult under top rail of old mossy pile of fence rails. Damp, not wet. Same situation otherwise as above.

Adult under foot square fragment of wood on ground. Slight cavity. Same situation as above.

Large adult under fence rail on ground. Situation as above.

2, large adult and brick striped large juvenile together on ground under fence rail. Rocks abundant throughout area.

5 Feb. Oregon: Curry Co., 11.2 mi. S Carpenterville

First account under P. dunni applies to this species.

7 Feb. Oregon: Curry Co., 7.5 mi. N Pistol River (town)

Large adult without stripe and brick-striped juvenile under rock near base of road embankment. Substrate of small rocks and course gravel mixed with sandy damp soil. Practically no vegetation here. See Rhyacotriton for description of adjacent canyon.

1 large adult (stripe-less) in same situation as above. Same embankment about halfway up.

W. Reiner
1949

Plethodon hardii

4 Aug New Mexico, Otero Co., Cloudcroft, 8600 ft. ±
Two specimens taken 1510 hours in rock rubble on steep hillside just out of town. Hillside above rubble thickly covered with fir and spruce with grasses and other annuals covering all exposed ground. Rubble near base of hill where timber rather scattered and annuals and grasses most abundant. Many of annuals were blooming wild-flowers. Blooming penstamen and young strawberry plants abundant. Animals taken under flat rocks loosely resting on soil. One of rocks size of outstretched hand and about 1 in. thick. Soil under rock well loosened by earthworms and also loose root mat present. Moss surrounding rock. Temp. of surface soil under rock 13.4° C. Slope exposed and well illuminated. Much similar habitat in vicinity. Both taken in about 15-20 minutes search. Heavy overcast and occasionally light sprinkle. Had rained heavily during morning. During morning had looked for about 2 hours under loose bark, in rotten logs, under fallen timber and bark slabs, under isolated rocks

W. Riemer
1949

Plethodon hardii

4 Aug. New Mexico, Otero Co., Cloudcroft, 8600 ft ±
and in leaf and rotten wood litter with
no success. R. Stebbins found 3
in bark flakes; he says[x]; not between
bark and wood but between cleavage
planes of bark. One other specimen
he took in old rock rubble of mossy
road cut. Ants abundant in wood
and under rocks, earthworms everywhere
even under bark of stumps and in
middle of rotting logs. Small centipedes,
millipeds, camel crickets, snails all
common under rocks as well as
in and about rotting timber.

W. Reiner
1949

Plethodon neomexicanus

14 Aug. New Mexico Sandoval Co., 12 mi. W, 4 mi. S Los Alamos, 8750 ft.±
Specimen taken under bark of fallen and well rotted section of Douglas fir (?) trunk. Bark well broken into slabs and overlying decaying very wet wood. Water easily squeezed from wood just under bark. Temp. under adjacent piece of bark 14.0° C Log section lying on moderate slope and oblique to it.* Eight feet from Bob's second specimen. Timber here not dense and ground with thin cover of red-berried, fern-like, 12-18" plants. When exposed animal attempted immediate escape into crevice in rotten wood. Found on uppermost portion of log. Adult.
Another specimen taken near center of well-rotted, wet log about 100 ft. from above specimen. Log at right angles to slope and well placed in soil along entire length. Log with bark except for small area just above animal. Temp. of wood at site of capture 13.8° C. Pulled apart at spot where animal resting. Made no attempt at escape, possibly because head still covered by fragment of wood. Slope, plants and exposure same as above. Adult.

W. Reiner
1949

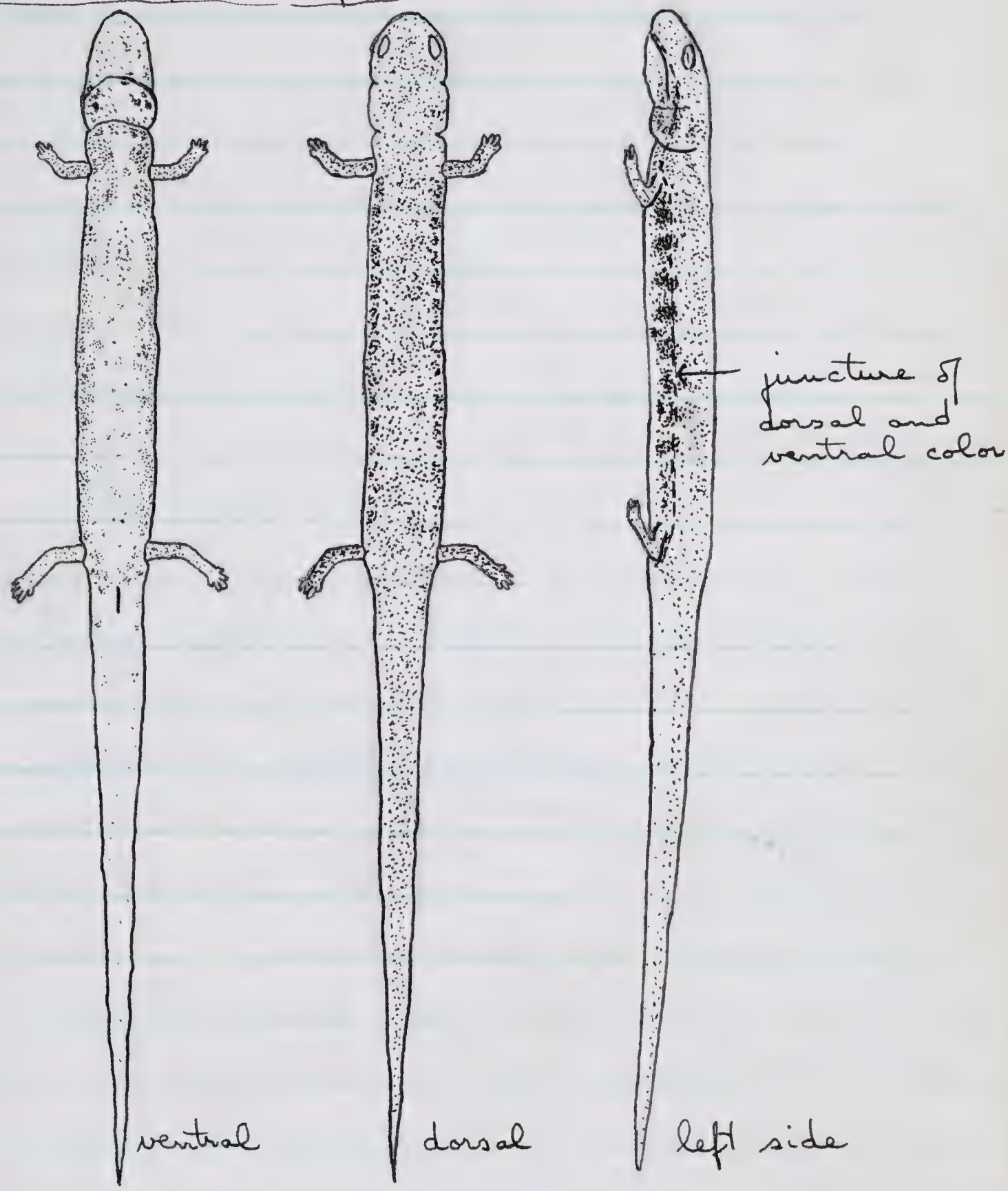
Plethodon neomexicanus

14 Aug. New Mexico, Sandoval Co., 12 mi. W, 4 mi. S Los Alamos, 8750 ft. ±
1830 a young (half-grown) animal taken in middle of extremely rotten log. Wood again very wet, 12.2° C. Log represented by low column of wood fragments directed up and down slope. Slope, exposure and plants as above. Spot about 100 ft. up slope from point first animal taken. Animal attempted escape into crevices in wood.
1845, an adult taken in middle of small, rotten, moss covered, log directed up-down slope. Temp. of middle wood 12.4°C.
1850, a subadult taken under same log as above but against soil and 8 ft. from the adult. All conditions of above apply.
See R. Stebbins notes for further details on niche and habitat.

W. Reimer
1949
14 Aug.

Plethodon neomexicanus

New Mexico, Sandoval Co., 12 mi. W., 4 mi. S Los Alamos, 8750 ft. ±



Guanophore distribution of specimen # 450 (W.J.R.) after about 18 hours in formalin. In all cases guanophores on dorsal surface of body very much finer than laterally and ventrally and too fine to draw as such.

W. Riemer
1949

Plethodon neomexicanus

14 Aug. New Mexico, Sandoval Co., 12 mi. W, 4 mi. S Los Alamos, 8750 ft. ±

Guanophore distribution: 4 groups

#450 - standard of comparison, see previous page.

Group 1 - guanophores on sides of body large, clumped and forming dominant color of that area. W.R.# 450, 453; R.S.# 3441, 3449, 3445.

Group 2 - guanophores on sides of body large and scattered or small and evenly distributed but about evenly balanced with ground color as to dominance. W.R.# 452, 455; R.S.# 3442, 3443.

Group 3 - guanophores on sides of body scattered and not balanced with or dominant to ground color. W.R.# 451, 454, 457, 458; R.S.# 3444.

Group 4 - guanophores absent. R.S.# 3448.

W. Riemer
1952

Plethodon vehiculum

6 Feb. Oregon: Coos Co., 2.6 mi. SW Coquille

1 taken under 12X6 inch fragment of wood in open moss enshrouded canyon. All trees present appear dead and fairly dripping with moss except for a rim of conifer along the ridges. Much dead wood, broad-leaf litter, ferns. Soil damp where animal taken, almost in canyon bottom. Tiny rivulet of water 20 feet away. 0745 hrs. Heavy grey overcast.

6 Feb. Oregon; Douglas Co., 11.1 mi. E Reedsport

1 tiny red-striped animal under small rotten log on dead leaf substrate at very base of cliff face described under Rhyacotriton. Slight overcast. Sun on opposite side of river. This N facing bank.

6 Feb. Oregon: Douglas Co. 12.0 mi. E Reedsport

Large ♀ with eggs taken under rock in rocky trail with slight seep along center. Standing water in cavity among stones where found. Stebbins says they prefer drier soil. Red stripe. Trail up small canyon in rock cliff face described above and in Rhyacotriton account.

7 Feb. Oregon: Coos Co., 2.6 mi. SW Coquille

2 adults taken under small log a few feet from spot where stripe-less form taken yesterday. See account at top of this page. These two with brick and tan stripes. Clear, sunny and bright at 1030 hrs. but canyon bottom entirely shaded.

W. Riemer 1953

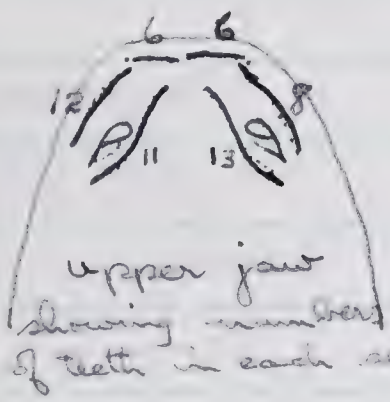
Rhyacosiredon

8 August [8 May 1940) Mexico: [Mexico]: Nevado de Toluca, N.W. slope; Ojo de Agua, 12,000 ft+.

Four present in MVZ. # 36609, 36610, 36611, 36612. Collector: S. B. Benson. # 7265 - 7268.

Benson's notes and photos reveal: (1) All 4 animals taken in small pool, (2) Vegetation at this locality primarily of dense pine forest and open bunch grass areas.

36612



upper jaw showing number of teeth in each series

Premaxillary - maxillary series might be considered as essentially continuous. Vomerine series anteriorly separated by distance equal to twice transverse diameter of choanae.

For all four specimens -

limbs when adpressed overlap with toes reaching to elbow.

Eleven costal ~~folds~~ grooves

36612 superficially resembles illustration of R. stanniusi in regard to general habit and pattern of spotting. None of other three specimens show an obvious pattern.

Illustration: Taylor, E.H. 1938 Univ. Kans. Sci. Bull. 25: 303 Plate 24 fig 2.

Snout - vent lengths:

# 36609	- 10	- 11	- 12
64 mm	67 mm	73 mm	58 mm

Total lengths:

126 mm	133 mm	139 mm	113 mm

Tail lengths: 62 mm 66 mm 66 mm 55 mm

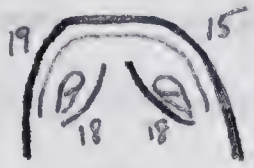
Riemer
1953

Rhyacosiredon

28 Aug. Mexico: [Mexico]: Nevado de Toluca, NW slope, Ojo de
(1 May 1940) Agua, 12,000 ft.+

36609 + 36610 with moderately developed dark brown toe tips. # 36611 + 36612 with toe pads only weakly developed and pale.

36611



upper jaw showing teeth present in each series

Maxillary - premaxillary series continuous. No obvious breaks in series except anteriorly between palatine series.

Counts made from freshly spread mouth

W. Riemer
1952

Rhyacotriton olympicus

6 Feb. Oregon: Douglas Co. 11.1 mi. E Reedsport

Subadult taken under rock in seep area of precipitous, small, foot wide cascading rivulet. Moss covering of rock indicates rivulet free from annual flooding. Stebbins took small Dicamptodon at same spot. A long precipitous rock wall cliff with road along base parallels river. Cliff wall with numerous such waterfall trickles.

6 Feb. Oregon: Douglas Co. 12.0 mi. E Reedsport

1 small adult between rocks and clean soil the whole covered with mosses at edge of trail described under P. vehiculum. Taken one foot from vehiculum. 6 feet to stream. No water but soil saturated where animal taken. Large juvenile taken few inches (3-4 in.) away under next layer of rock. Here a tiny trickle of water. Subadult in half-dollar sized gravel under sluice – wet by constant leaking through wooden sluice.

7 Feb. Oregon: Coos Co., 2.6 mi. SW Coquille

Adult under log lying in seepy stream bed. 30° slope or less mostly mud with scattering of soft sandy rocks. Dead leaves but little moss in stream bed. See P. vehiculum. Animal half buried in mud.

W. Riemer
1952

Rhyacotriton olympicus

7 Feb. Oregon: Curry Co., 7.5 mi. N Pistol River (town)

Small larva (?) from among rocks of small overhanging ledge shaded by fern plant. At base of ledge in water 1 foot from edge of stream. Tangled canyon with unknown broadleaf along stream, conifer on slopes, ferns everywhere over ground. Opening in canopy above. Stream a series of rapids down gentle slope but rushing over rocky bed. Stream 3-4 feet wide.

8 Feb. Calif.: Humboldt Co., 1 mi. SE Big Lagoon, tributary of Maple Creek

Adult under palm-sized rock on sand gravel substrate 6 inches from moderately flowing portion of 6 foot-wide cascading stream in dense redwood, Doug. fir(?) forest. Ferns and moss abundant. Dicamptodon larvae in quiet pools of stream. At 1030 hrs. weather clear sunny and bright but canyon entirely shaded.

W. Riemer
1949

Taricha granulosa

18 Dec. Calif.: Marin Co., 2.5 mi. W, 0.5 mi. N Las Gallinas
Single adult taken on roadway about ½ mi. from T. torosus. Road wet, shaded. Other DOR specimens about. Specimen lacks light iris patches iris being slightly lighter and greener(?) than black pupil. No indication of breeding condition being approached. Scattered tubercles on venter.

18 Dec. Calif.: Marin Co., 1.5 mi. W, 0.5 mi. N Las Galinas
Single juvenile taken under log on grounds of Marin Co. Hospital and Farm. Large number of cut logs and stumps scattered over open meadow area and more rotten logs and debris long small stream paralleling road. Specimen taken near stream.

18 Dec. Calif.: Marin Co., 5 mi. W, 1 mi. N Novato
3 specimens; 2 adult, 1 subadult taken in very damp, shaded grove of laurels adjacent to stream. Two of individuals in tiny seep of water draining from road. Much litter and debris overturned in attempt to find animals, however, all taken while walking on surface. Two in seep may have emerged from mouths of burrows after overlying debris disturbed. In

W. Reiner
1949

Triturus granulosus

18 Dec. Calif.: Marin Co., 5 mi. W, 1 mi. N Novato
both instances animals discovered after ~~cover~~ debris had been overturned for perhaps a minute or two. Third specimen spotted after pulling apart pile of cut green boughs. Had it been hidding beneath such shelter? Ensatina taken here also but noted no Aneides. Nearby stream large and muddy, probably as result of current rains.

W. Riemer
1951

Triturus granulosus

18 Mar. Calif.: San Mateo Co., 2.3 mi. W San Bruno, State Hwy 5. There are two large permanent pools here. One bordered on one side by cypress, on the opposite side by an open grassy slope; the other is ringed, and largely shaded, by eucalyptus. Dr. R.I. Smith of U.C. Zoology Dept. brought in about 8 larvae of this species collected 11 Mar. 1951 in one or the other of these pools. The larvae are about 3/4 grown, probably hatched late last spring, would probably metamorphose this spring. A careful examination of these two pools revealed both larvae and adults along the open grassy slope of one of the pools. They were not seen any other place. At place where taken water temp. 13.0° C at about 1030 hrs. Substrate of pool here sedgy and with grass-like growth in shallow water as if pool level very high at present. Adults in about 3 ft. of water though not possible to see deeper; larvae in about one foot of water. Captured 3 larvae of same size as those taken by Smith, one post-larval young (in water!), and 34 adults of which 3 were plump, laying (?), females. Two of ♀♀ with small gill stubs present. Could these animals be

W. Riemer
1951

Triturus granulosus

18 Mar. Calif.: San Mateo Co., 2.3 mi. W San Bruno, State Hwy 5. neotenic? A large Thamnophis sirtalis multilineatus captured had what appeared to be an adult Triturus torosus in its stomach though the identification might possibly be incorrect. If granulosus is present this far up the peninsula one might expect it to occur also in San Andreas, Crystal Springs, and Pilarcitos Lake.

20 May Calif.: Sonoma Co., Skaggs Springs Six adults and subadults(?) taken in stream. Stream clear, wide (50 ft.), with moderate current. All but one taken in immediate vicinity of deep (6 ft perhaps) pools where current slow. One in broad shallow portion of stream. Impressed by lightness of dorsal coloration and general resemblance to T. torosus. Only T. rivularis found at this locality in early March.

20 May Calif.: Mendocino Co., 4 mi. SW Ukiah, Robinson Creek Two adult T. granulosus taken here. Stream of size twice that of Pinehurst stream. About 25 ft wide, pools present but not very deep (3 ft perhaps) many rocky "rapids" spots. Granulosus in deepest, quietest portions. T. rivularis larvae from "rapids" areas. No larvae found.

W. Riemer
1957

T. granulosus

20 May Calif.: Mendocino Co., 8 mi. WSW Willets

Zweifel found one adult in wet, marshy spot below spring. Far above canyon bottom (½ - 1 mi away).

18 Aug. Calif.: ~~Mte~~ Sonoma Co., ~~Skaggs Springs~~ Warm Springs Creek, 1 mi. W, ½ mi. N Skaggs Springs

Four large adults of this species taken in bottom of shallow, quiet side pool half buried in bottom debris. All four together. Water 24° C. Also found one subadult in water in small quiet pool of small rivulet draining into main stream where adults taken. Could find not larvae.

9 Sept Calif.: Marin Co., Samuel P. Taylor State Park, 2 mi. W, 1 mi. N Lagunitas

Two large adults and seven larvae taken in one hour in Paper Mill Creek adjacent to highway in park. The stream is wide, 20-25 feet, but shallow, 4-5 inches except for occasion deep pools of more than 4 feet. All larvae apparently confined to very shallow water along edges where mats of dead submerged leaves plentiful. Also in such places a current was lacking. Other niches examined eg. algal mats in shallow midstream, rocky areas, deeper pools 10" - 2 feet. Fish present in all pools and may so preclude presence of Triturus. Crayfish remains found in several places.

W. Reiner
1951

Triturus granulosus

9 Sept. Calif.: Marin Co., Samuel P. Taylor State Parks, 2 mi. W, 1 mi. N Lagunitas
Adults both taken in water in same location as larvae but merely resting on bottom not hidden in dead leaves.
Total lengths of larvae: 43, 40, 37, 37, 35½, 34, 34 mm.

20 Oct. Calif.: Napa Co., 3½ mi. E, ½ mi. S Mt. St. Helena
At place known as "Montesol", residence of a Robert (?) Livermore 29 individuals were collected. Animals were taken from a series of 3 pools, all shallow (6 in. to 2 ft), well shaded, and with rocks and vegetation for hiding in. These 3 pools connected by open drainways and held water from spring. Most of animals however from a deep (about 6 ft.) artificial pool with no ~~hiding~~ hiding place except a few logs on bottom and thick masses (?) growing on walls. Pool stocked with large trout. Trout appeared not to bother the Triturus in any way. Pool in part sunlite but temperature at about 1100 hrs. 12° C. Although most animals moving about independently a few pairs both in shallow and deep pools in amplexus. These pairs with ♂♂ with fully developed, placid cloacas. Some with partly developed breeding pigments on soles.

W. Rieman
1957

Triturus granulosus

20 Oct. Calif.: Napa Co., 3½ mi E, ½ mi. S Mt. St. Helena

All ♂♂ with at least partially developed aquatic characters. It is difficult to see how eggs (or larvae) of Triturus could long survive with the trout present. Perhaps entire population is made up of individuals entering pool to breeding and then remaining without being able to actually raise any young. Probably in troutless shallow pools eggs and young do survive. No larvae seen in deep pool; shallow pools not examined for larvae. Do the adults remain in the water all year? What is the normal breeding season? Do young survive in trout pond?

W. Riemer
1952

Taricha granulosa

3 Feb. Calif.: Mendocino Co., 9.4 mi. SSE Willets

Single adult walking about on wet leaf litter in dense grove of bay. Ground well shaded and considerably darker than out from under the trees. No understory but tangle of bare vines and dead twigs. 75 feet to stream, ground level. Adjacent oak-bay-madrone forest. Overcast sky. This animal much different from Bay area animals in that belly more vividly orange, back less blackish.

Pair in amplexus in shallow (4-5 in.) pond in bay woods. Pool result of flooding. 12X3 feet. Thick leaf litter on bottom. Animals quiet and half hidden in ~~leafs~~ leaves on bottom. ♀ smaller than the above animal. ♂ resembles Taricha in some characters eg. eyes, teeth, snout length.

4 Feb. Calif.: Humboldt Co.

Pools, streams and ditches examined for Triturus between Fortuna and Orick. None found. In dense redwood stands deep (1-3 feet) clear, quiet pools with much floating wood and thick layer of redwood duff on bottom. Water 10° C, air 1 foot above water 12° C, 1015 hrs. Site considered perfect except possibly that species does not like dense redwoods.

In dense alder stand, pools and rivulets

W. Riemer
1952

Triturus granulosus

4 Feb. Calif.: Humboldt Co.

examined. Air 1 foot above water 13° C., water 9½° C. Site considered perfect.

In open spot in small valley examined drainage ditch, swampy pools and ~~stock~~ open ditch pool. Ideal looking spot. Exposed, sunny, open water and some with tangle of cattails and blackberries. No Triturus. Local resident of 4 months says no water dogs of stream-pond type.

Examined large floated meadow, water to 3 feet deep, bottom with grass and weeds at edges. Water 12° C at entering stream. No Triturus. Suspected series of pools in meadow. Largest pool 150 feet long. To 4 feet deep, murky, low grass and herbs on bottom. Air 14° C 1 foot above water which was 14° C also, 1630 hrs. Meadows ~~at~~ near Orick. Attendant at Prairie Creek Hatchery close by says currently having unseasonal warmth and water dogs appear in numbers in April.

5 Feb. ~~Fb~~ Calif.: Del Norte Co. 2¼ mi. S 2¼ mi. E Fort Dick

No Triturus in extensive pool in meadow 1-2 feet deep. At edge of woods. Grass bottom. From seep from adjacent bank. Air 1 foot above water 16° C, H_2O 13.5° C.

W. Reiner
1952

Taricha granulosus

5 Feb. Oregon: Curry Co., 1.4 mi. SSE Carpenterville

2 adult ♂♂ in small roadside pool about 6X12 feet by 8-10 inches deep. Rock, grass, moss bottom. Ferns lining and dripping into one side. At edge of Doug. fir forest, other side of road timber long ago removed. Water clear, still. Animals on bottom. One with first indications of breeding pigment on soles and thighs. Pool in shade. Air temp. 7¼° C water 7° C. 1530 hrs. Snow at roads edge several hundred feet away.

5 Feb. Oregon: Curry Co., 2.7 mi. S Pistol River (town)

4 adults from large pool in rolling hill sheep meadows. Tangle of willows(?) over much of pool. Water temp. 11.1° C, air at ground 9.5° C at 1615 hrs. Apparently just entering breeding condition. Water murky with much leaf litter on bottom. Sow bugs and gopher burrows abundant in surrounding extensive treeless, shrubless meadows.

5 Feb. Oregon: Curry Co. Gold Beach

Roadside pool 30 X 100 ft. and to 2 feet deep with no Taricha. Water 12½° C, murky. Bottom with grasses, some floating and scum-like algae on bottom.

5 Feb. Oregon: Curry Co., 10 ~~½~~ mi. S Ophir

Drain ditch with flowing water and quiet pools, and extensive roadside ditch pools with no animals. Pool 11° C, flowing water in ditch 10° C, at 1730 hrs. Extensive roadside meadows.

W. Riemer
1952

Taricha granulosus

6 Feb. Oregon: Coos Co., 0.7 mi. N Myrtle Point

No Taricha in open meadow pools or in those shaded by dense stands of Umbellularia. Open river bottom grazing land with scattered clumps of bay. Large amounts of standing water. Temp. in water 8-10°C, air over water 8°C. Reason for absence unknown unless populations thinly spread because of extensive flood water areas.

6 Feb. Oregon: Coos Co. 4.1 mi NNE North Bend

1 small adult in roadside drainage ditch 1 foot wide 1-2 inches deep. Sediment & leaves on bottom. Thicket of young Doug. fir and small broadleafs on same side of road covering steep bank. Coos Bay on opposite side of road. Only traces of breeding pigments on soles & thighs. ~~Air~~ Water 9½°C, air above water 1 foot 10°C. Weather: broken overcast, site in shade.

Locality?
6 Feb. Deep and shallow coffee color pools in grassy & hummock grass meadows of shallow valley. Water 10°C, no Taricha.

6 Feb. Oregon: Douglas Co., 8.6 mi. E Reedsport

6 adults, 2 pair in amplexus in deep (probably 4-5 feet) roadside pool. Very apparently a permanent or nearly permanent pool almost surrounded by willows (small) and blackberries. Opposite side of road from cliff described under Rhyacotriton. Flat open river bank shelf with scattered conifers

W. Riemer
1952

Taricha granulosa

6 Feb. Oregon: Douglas Co., 8.6 mi. E Reedsport
Temp. of water 8°C at 1620 hrs.

Pool 20 × 40 ft. with rather steep sides. An adjacent shallower pool with large double fist-sized egg mass thought by Stebbins to be of A. gracile. R. aurora(?) egg mass also present. The former from undeveloped to elongate stage. No Taricha in shallower pools to 2 feet deep.

6 Feb. Oregon: Douglas Co., 3.7 mi. E Reedsport

Single adult taken while crossing dry roadway at dusk 1715 hrs. Moving from extensive flooded grassy meadows (where no Taricha found) toward wide, muddy drainage channel on opposite side of road. Hyla present in large and burrows choruses in meadows. Rodent mounds everywhere. Present impression is that species prefers deep, permanent pools with rodent burrows or other sources of cover and escape when leaving the water. Trees are not necessary but at least rolling ground with some shrub cover necessary.

7 Feb Oregon: Curry Co. 0.6 mi. N Langlois

7 adults from deep (6-7 feet) 20 × 20 ft pool. Water clear, much grass-like growth on bottom, patches of Spirogyra on surface. Water temp. 11.4°C at surface over deep water,

Hyla, R. aurora also present, egg clusters of Hyla, R. aurora and A. gracile(?) present, the latter two in deep 2-4 feet water. Two Taricha not captured.

W. Reiner
1952

Triturus granulosus

7 Feb. Oregon: Curry Co., 0.6 mi. N Langlois

Terrain almost flat. Large clearing in conifers. Dry grass meadow surrounding pool. 1 pair in amplexus.

7 Feb. Oregon: Curry Co. 2 mi. N Ophir

Large numbers present in deep pool 150 X 100 feet. In hollow in rather steep rolling grassy hills facing on ocean. Ocean about 1/4 mile distant downslope. Hills treeless except for willow(?) clump at on edge of pond. Waterlilies in deeper water, sedges along edges. Land used for sheep grazing. Rodent burrows ~~abou~~ abundant. Rocks, boards and other surface litter no abundant. Gracile(?) eggs, Aurora eggs, and Hyla eggs common. Adult gracile found dead on floating grass, young taken under board near water. Adult ♂♂ most abundant. One ♀ in water alone, one in amplexus, one under board. ♂♂ swimming with sine-curve tail undulations only, body apparently quite still. Limbs held against sides while moving but extended loosely laterally on slowing down for a stop. ♂ Upon moving again limbs again held backward against body. Steering accomplished with tail. ♂♂ follow any other ♂ when one swims close by apparently attracted by

W. Reiner
1952

Taricha granulosa

7 Feb. Oregon; Curry Co., 2 mi. N Ophir

the nature of the movement rather than oder. Frequently one trys to mount but such a mount was not observed to last more than a fractional second. Often 6-8 in view in slightly cloudy water at edge at one time. Apparently ♀♀ have not yet come to the water in numbers. Water temp. near shore 12° C. Weather clear, sunny, bright at 1515 hrs.

7 Feb. Oregon; Curry Co., 1.4 mi. SSE Carpenterville

Pool in which 2 Taricha taken 5 Feb. now at least 10 inches lower in level. Snow along roadway above largely gone now. Taricha apparently do on occasion get into pools which are not permanent. This however appears to be exceptional.

8 Feb. Calif.: [locality ?]

Coffee colored extensive pool between highway and beach dunes. To 4 feet deep. Gracile eggs present in small numbers. Aurora captured. No Taricha. Why? Water 12° C. 1215 hrs.

13 Feb. Calif.: Santa Clara Co., Stanford University, Lake Lagunita

Water high and murky to depths over 6 inches. No Taricha seen. Jay Savage says they do not use lake. However he claims this species confined to ridge line on peninsula and torosus present at lower altitudes.

W. Rieman
1952

Triturus granulosus

13 Feb. Calif.: San Mateo Co., 2½ mi. W San Bruno

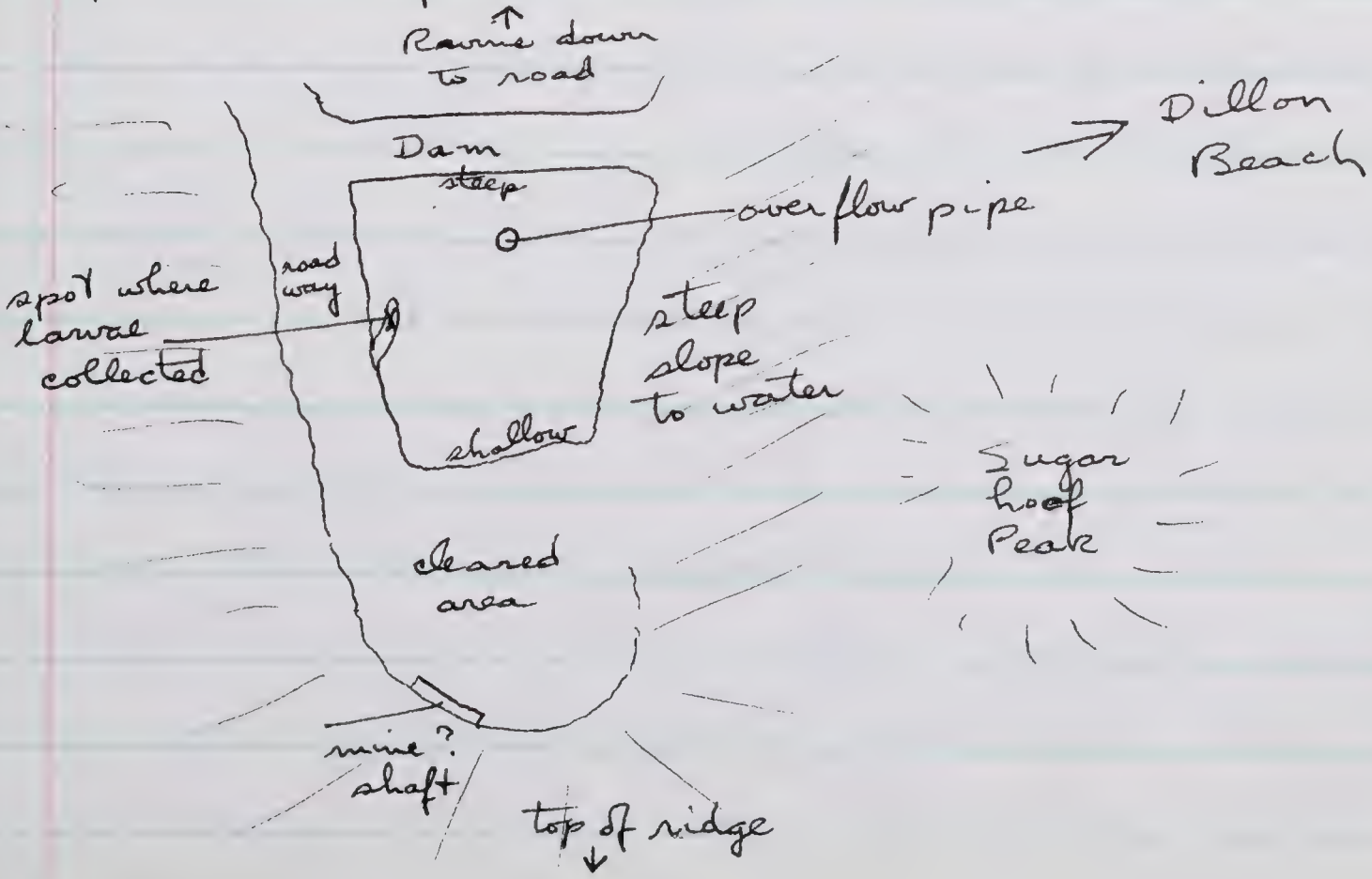
6 young taken in 2 groups of 3 under small logs in wet grassy seep area between two small lakes. No others seen except 2 adults in amplexus (but very dead) in lower of lakes. Too dark to see well in dark stained water. 1730 hrs.

31 Jan. Oregon: Benton Co., 7 mi. N Corvallis

See Journal of 8 Mar. 1952.

9 Mar. Calif.: Marin Co., 0.4 mi. E, 0.1 mi. N Dillon Beach

On report of Marvin Larsen — a zoology student at Berkeley — I made search of small reservoir about 75 feet square for larvae of this species. He had collected some large larvae (see catalogue for 23 Feb. 1952) in this pond. On this date I could find none although water murky and search not made at precise spot where his collected.



W. Riemer
1952

T. granulosus

30 Mar. Calif.: Marin Co.

Noted, but did not examine, several pools in canyon bottom — easily visible from the highway. These pools on property of Green Gulch Ranch, 2 mi. W, 3½ mi. N Point Bonita. Stream with willows and apparently permanent water examined below pools but no Triturus seen. This may be good place to reinvestigate.

In stream in Frank Valley, 1 mi. E, 4 mi. S Mt. Tamalpais (West Peak) captured 1 adult ♂ in shallow water at edge. In full breeding condition. This stream examined for larvae last 12 Aug. but without success. Ideal appearing place but considerable search ~~seat~~ revealed no more animals. 1 Rana boylii taken also. H_2O temp. 16°C at 1245 hrs.

Finally, in checking road between north end of Bolinas Lagoon and Olema, found a large shallow pool on W side of road about ¾ mi. E, 1½ mi. S Olema on "Murphy" Ranch. Caretaker of this land says a larger deep pool on E side of road. Mr. Boyd Stewart of next ranch south has offered use of pools on his land but does not think them good for Triturus. Single gravid ♀ taken from pool described above.

W. Riemer
1952

Triturus granulosus

23 Feb. Calif.: Marin Co., 0.4 mi. E, 0.1 mi. N Dillon Beach

7 larvae collected this date by M. Larsen.
Iris pigment distribution recorded 4 April 1952.

12 Apr. Calif.: Santa Cruz Co., Waddell Creek, 3¼ mi. E Ano Nuevo Point, 25 feet

4 very granular ♀♀ (small) taken in pools in disturbed area where log cutting operations were being carried on. Pools mostly water filled vehicle tracks. One such 2 feet by 4 feet by 4 inches deep had 3 granulosus and one large adult ♂ torosus. Another pool with 3 torosus adults (2 ♂♂, 1 ♀) and 1 granulosus. Spirogira algae in water, clear but with mud bottom, oil slick on one pool. Water temp. 11½°C at 1230 hrs. Lumbermen there report this species (?) common in upper parts of this same clearing, it being called Stevens Camp. Small tributary flows along edge of clearing.

~~3 May See T. torosus account for this date.~~

29 June Calif.: Contra Costa Co., Tilden Regional Park, Jewel Lake

S. F. Cook, Jr. reported that on 25 June there were large numbers of Triturus in

W. Reiner
1952

Taricha granulosa

29 June — Calif.: Contra Costa Co., Tilden Regional Park, Jewel Lake

pool below spillway of Jewel Lake dam. He claims they are present there throughout spring. Cook is both U.C. student in biology and assistant park ranger(?). Gus Rosenthal, M.V.Z. student, could not catch any Taricha in this pool 27 June but claims they were present in good numbers. Following rain on night of 27 June and all day 28 June, I searched pool on morning of 29 June very carefully. No Taricha. Water murky. Could disturbance of water by rain or increase in flow be stimulus for animals to leave water to avoid being washed away? Could animals have been waiting to have wet surrounding ground to traverse on leaving pool? On returning to car found one subadult walking across muddy pathway about one-quarter mile upstream from lake.

13 July — Calif.: Marin Co., 4 mi. NW Fairfax

S.F. Cook, Jr. collected 4 adults, 2 juveniles in stream here. States many more present. While in laboratory (presumably during night of 18 July) one ♀ laid eight eggs of which only one attached to jar bottom. Others may have been loosed from point

W. Reiner
1952

Triturus granulosus

13 July Calif.: Marin Co., 4 mi. NW Fairfax

♂ attachment by movements of other animals in same container. When preserved an additional egg present in cloaca. ♂ without prominent signs of breeding condition.

425 feet

26 July Calif.: Marin Co., 1½ mi. E San Geronimo, San Geronimo Creek, A

It is suspected that this locality and that above are identical. On this date collected 1 apparently mature but small adult ♀ in streambed pool. Pool 3 X 15 feet by 6 inches deep. Water clear, 15½° C at 1320 hrs., considerable mat of Umbellularia leaves on bottom. Among such a mat at extreme upper end of pool where trickle from next higher pool entered found only one larva about 2 cm. long. Numerous small snails and water-boatmen also amongst leaves. This spot in redwood stand. Also present Umbellularia, a maple, ~~oak~~ Corylus rostrata ~~elm~~ (?), ferns. Saw no Triturus further upstream in this redwood grove. Why are larvae so scarce in this area? See R. boylii account also. Two more larvae of same size from other parts of same pool. Several more larvae (7) taken in similar pools downstream. None seen beyond zone of redwoods although because of small numbers present this may not be significant. In one pool found with numerous tadpoles and much Spirogyra.

W. Riemer
1952
1953

Taricha granulosa

9 Aug. Calif.: Contra Costa Co., Tilden Regional Park, Jewel Lake
In pool below dam spillway captured 5 animals; 4 adult, 1 subadult. All except the single large ♀ are emaciated to a greater or lesser degree. Also only ♀ appears as unquestionable granulosus and although others have small eyes they show other characters reminiscent of torosus. Pool deep (more than 3 feet), quite murky and probably never gets warm because of dense overhead cover, mostly of Umbellularia. All animals taken were on or near edge of pool. Large aurora also present.

29 Jan. Calif.: Contra Costa Co., Tilden Regional Park, Jewel Lake
See account for T. torosus for this date.

5 Feb. Calif.: Sonoma Co., Wild Cattle Creek, ½ mi. S, 4½ mi. W Skaggs Springs
See account of T. rivularis for this date.

15 Feb. Calif.: Napa Co., 3½ mi. E, ½ mi. S Mt. St. Helena
Collected 12 of this species in artificial pools. See 20 Oct. 1951 of this species for description of place. Big trout pool at noon 10½° C. I have impression much more moss on walls of pool. Few trout. Taricha far less abundant. In small spring-fed pools one pair in amplexus. Aquatic condition of ♂♂ much advanced over condition on prior visit. Temperature of spring pools 12° C.

W. Riemer
1953

T. granulosus

Yorkville
8 Mar. Calif: Mendocino Co., Rancheria Creek, ½ mi. N, 1½ mi. W A

large numbers of granulosus and rivularis in main stream immediately above (upstream from) bridge on road to Anchor Bay at junction of Anchor Bay road and Calif. Hwy 128 at Yorkville. Representative unbiased sample of animals present: 29 (more than this number collected). granulosus, 80 rivularis. Of these were ♂ granulosus, were ♀; were ♂ rivularis, ♀. At 1230 hrs. 12°C in water. Both species frequently paired in amplexus. Redwood - Douglas Fir forest but wide stream bed plus adjacent highway provides openness permitting plenty of direct sunlight to stream. Stream 30 feet wide, 3 to 6 inches deep but with numerous deeper pools — to 4 - 5 feet. Water along edges generally quiet, especially in pools and most of animals of both species in such quiet deep water. Rivularis however frequently present in shallower portions with moderate ~~soap~~ rate of flow. Granulosus almost exclusively in quietest water. Stream bed gravel and rock with essentially flat, wide surface. Frequent sandy bottoms near pools. Shores rocky with little stream bed vegetation but numerous edges with projecting roots or island clumps of a course grass. Brief search for eggs produced

W. Reiner
1953

Triturus granulosus

8 Mar. Calif.: Mendocino Co. Rancharia Creek, ½ mi. N, 1½ mi. W Yorkville

none. About 45 min. spent in observation on amplexing pair of granulosus. 1200 hrs. pair in amplexus in small foot deep pool at edge of stream. Water quiet, protected by partially submerged log fragment and island tuft of grass. Tangle of submerged, exposed roots over much of substrate. Resting quietly on bottom in shallow water at edge. Unless anxious to move rapidly periodic movements from place to place accomplished entirely by use of tail of ♂. ♀ inert. Both used tail when attempting to escape when: (1.) ♂ rivularis approached closely, (2.) ♂ granulosus approached closely. 1206½ hrs. pair broke surface of water following attempted escape from intruding ♂. Intruder ♂ leaves. Reattacked by ♂, pair swims away to break surface of water at 1211½. Intruder swims directly toward clasping pair from 3-4 feet away. Can they see this far in water? Approaches muzzle to cloaca of ♀, clasps ♀'s tail with hind limbs in order to remain in fight. Rolling ~~fight~~ fight. Little rest or lack of motion during such fight. 1215 pair breaks away and comes to surface. ~~Intruder~~ Intruder follows immediately to where pair settles. Intruder clasps ♀ in reverse — belly

W. Riemer
1953

Taricha granulosa

8 Mar. Calif.: Mendocino Co., Rancheria Creek, ½ mi. N, 1½ mi. W Yorkville

to belly and chin to ♀'s cloaca. ♀ and ♂ readily distinguished particularly with reference to tail fin and dorsal pigmentation. 1224 hrs., little activity for 6-8 minutes except slowly and periodically rolling around. Each ♂ with clasp on one-half of ♀. Third ♂ within 4½ feet and in line of view of group. Pays no attention and leaves. Tail-tips of ♂♂ rather constantly slowly moving as if describing sine curves. 1233 hrs., third ♂ enters group. Rivularis ♂ close (3 in.) by, pays no attention. Another ♂ rivularis approaches group "sniffs?" cloacal region of ♀, wanders off. 1241 hrs., intruder ♂ with ♀ breaks away, rises to surface. ♀ reversed. Once resting in quiet water ♂ quickly turns around without releasing hold.

8 Mar. Calif.: Mendocino Co., Mill Creek, ½ mi. S, 4 mi. W Yorkville

Small stream in dense Douglas fir-redwood forest. Stream 4-6 feet wide, 1 foot deep, rocky bottom. 1515 hrs. 8½° C. T. granulosus and rivularis present. Granulosus appears more abundant. Animals not abundant here. Saw no sex activity.

9 Mar. Calif.: Sonoma Co., several localities

See account of T. rivularis for this date.

W. Reimer
1953

Taricha granulosus

16 Mar. Calif.: Napa Co., Chiles Creek, 2 mi. S, 4 mi. E Angwin, 850 ft.

Series of about one dozen taken in small stream flowing through gently rolling valley grazing land. Adjacent slopes 1/4 mile away with laurel-oak-digger pine cover. Stream about 6 feet wide, 1 foot deep with numerous shallows and deep pools. Temperature of water at 1200 hrs. 12½°C. Water clear with moderate flow. Bottom of sand, silt, rocks. All individuals taken were single except one group of 3 in amplexus. ♂ actually clasping ♀ was beneath her with his cloacal lips enclosing hers, his being much swollen and flaccid. Single R. boylii seen, two medium-sized Clemmys. Fish abundant. Apparently Taricha not severely preyed upon by Clemmys or they would not appear to be so common. From appearance of stream and surroundings I would have expected to find torosus here. It is notable that this stream is one of the upper ends of the Napa River where T. torosus taken on this date.

16 Mar. Calif.: Napa Co., Pope Creek, 7 mi. E Pope Valley (town), 350 ft.

See account of T. torosus for this date.

22 Mar. Calif.: Marin Co., Woodacre, 1½ mi. E San Geronimo, San Geronimo Creek 425 ft.

Examination of stream revealed no animals of this species. Known to be present from past collecting of larvae. Stream murky from recent

W. Reiner
1953

Triturus granulosus

22 Mar. Calif.: Marin Co., Woodacre, 1½ mi. E San Geronimo, San Geronimo Creek, 425 ft.
rains. Do animals leave stream when it is muddy? because they can't see? 1120 hrs. temperature of stream 10° C.

22 Mar. Calif.: Marin Co., Lagunitas Creek, ½ mi. N, 1½ mi. E Olema
Here stream also muddy but on wide flat flood plain of river bed several isolated pools in which water relatively clear. Deepest of these pools and one from which all but two of animals taken came 15° C at 1345 hrs. Pool 6 X 10 feet and 3 feet deep. Several pairs in amplexus.

22 Mar. Calif.: Marin Co., ¾ mi. E, 1½ mi. S Olema
Pool here 18-19° C at 1430 hrs. Cloudy water making visibility poor even in shallow water. 2 animals taken and several more seen but not captured. A torosus egg cluster seen with all larvae gone. Could this species be present? Could some granulosus lay clusters of eggs?

30 Mar. Calif.: Sonoma Co. See T. sierrae for this date.

4 Apr. Calif.: Santa Cruz Co., East Waddell Creek, ¾ mi. S, ½ mi. W Big Basin Redwood Park, Headquarters, 950 ft. See also T. torosus. Two ♀ taken in isolated side pool a few feet from stream. 1200 hrs. temperature of pool, 9° C. Stream also 9°. Water yellow and yellow scummy algae on sand-silt bottom. Scum on surface.

W. Riemer
1953

Taricha granulosa

4 Apr. Calif.: Santa Cruz Co., Bear Creek, 1½ mi. N, 1¾ mi. E Boulder Creek (town), 650 ft. See account of T. torosus for this date.

13 Apr. M.V.Z.

A group of granulosus and torosus ♂♂ captured 16 Mar. in Pope Creek, Napa Co., have been kept at 6° in water since capture date. Many of ♂♂ at that time were commencing ♀♀ at height of breeding season. Now all ♂ torosus had lost much of breeding condition, ie. pigments, smooth skin, tail fins, etc. ♂ granulosus in magnificent breeding condition yet. There is here a physiological difference in response to environmental conditions under which the animals were kept.

3 May Calif.: Shasta Co., 1 mi. NE Ingot

In a small (4 ft. wide) tumbling stream collected 48 of this species and 4 Taricha sierrae. There appears to be no ecological segregation of the two forms. I was alarmed to see this species in such a mountain brook habitat similar to what one might expect T. rivularis and so unlike the still quiet water usually associated with this species. One of each species ~~was~~ was taken in flood pools adjacent to main river. These pools were 17° C. Streams to be mentioned

W. Riemer
1953

Triturus granulosus

3 May Calif.: Shasta Co., 1 mi. NE Ingot

were both 15° C. One of two adjacent streams about 100 yds apart was without Triturus of either species as determined by extensive search for about one hour. The other stream was abundantly populated. Comparison showed streams to have what appears to be two different rock types in them. In all other regards both streams seemed identical. Water and rock samples were taken. Vegetation: Douglas fir, yellow pine, digger pine, several oaks. Douglas fir most abundant in stream canyons.

W. Riemer 1953-1954 Triturus granulosus

18 Sept Calif.: San Mateo Co., 2½ mi. W San Bruno

Collected 6 large post-larval individuals which appeared to have remnants of gill stubs from under large log near edge of small lake. Lake is lower (northernmost) of two present at point where San Francisco County Jail road intersects with Skyline Blvd. Soil wet. Found none under other logs present. No Batrachosceps present as is usually the case. These young died in captivity and were not saved.

1954)

3 Feb. Calif.: Contra Costa Co., Briones Hills, 3¾ mi. N, 1¼ mi. W Lafayette

See account of Taricha torosa for this date.

23 Feb See account of Taricha torosa for this date.

1 Mar. " " " " " " " "

5 May Calif.: Santa Cruz Co., Big Creek, Swanton

See account of T. torosa for this date.

25 Sept. Calif.: Contra Costa Co., Briones Hills, 3¾ mi. N, 1¼ mi. W Lafayette

Examination of the pools at this locality reveals the presence of this species as adults, the lack of torosus. The lower of the two pools and the one first seen from the road has a dense stand of cattails at one end. This pool superficially examined and no newts seen. The larger pool, a hundred yards farther up the road, lacks cattails but has a group of willows along the S(?) shore. A mat of water weed covers most of the surface. Majority of Taricha taken were in vicinity of depressions in mat surface or along edge, in situations where ~~escape~~ unencumbered escape could be made. Escape was always attempted sharply downward into murky water and weeds. Most seen

J. Riemer
1954

Taricha granulosa

25 Sept. Calif.: Contra Costa Co., Briones Hills, 3 3/4 mi. N, 1 1/4 mi. W Lafayette

were resting on edge of weeds just below water surface. Three that were together were on bottom in weed-free water under willow tree branchs hanging into water. It is then presumed that at this season the animals show a real preference for shaded areas of clear water and/or thick mats of vegetation suitable for quick retreats. Deeper portions, over three feet, could not be examined. Even entire of pool is matted with weeds. 8 adults taken, several additional seen. Large larval T. torosa abundant every where. No larval granulosa seen. Pool level down from spring high. Drop of about 12-18 inches. Water yellow and murky. Several Thamnophis elegans vagrans seen, one large on regurgitated an adult granulosa about half digested. Two seen in water, submerged, other two hiding in sedges at edge of water. One of adults of granulosa quite pale, hind feet highly vascularized and swollen. Others seen lathargic.

First mentioned pool reexamined. Many fish but no adult Taricha. Took one larva of each species, granulosa slightly smaller than the longer torosa. Size development of larvae populations probably essentially the same. Patterns of larvae highly distinctive, larvae not common in this pool.

D. Kuemer
1955

Taricha granulosa

7 Jan. M.V.Z.

This constitutes an experiment in marking amphibians with the use of injected pigments. All subjects used are of this species unless otherwise noted each being injected with about .05 cc of various colors of Higgins waterproof drawing ink unless otherwise noted. All injections are subcutaneous.

Toes clipped	Location	Color
RF 1	left groin	Brown
RF 2	left axilla	Brown
RF 3	Mid-ventral	Red (Scarlet)
RF 4	Sub-caudal (base)	Red (Scarlet)
LF 1	Gular	Blue
LF 2	Mid-ventral	Blue
LF 3	Groin	Green
LF 4	Pectoral	Black
	Pelvic	Higgins Eternal

18 Jan. After this interval of time the animals show the following conditions:

RF 1 Predominantly restricted to left groin - inflamed.
RF 2 Pectoral area brownish gray
RF 3 ?
RF 4 Restricted - appears somewhat inflamed.
LF 1 Died
LF 2 Trunk ventrally green - rest of venter discolored
LF 3 ?
LF 4 Venter uniformly muddy green, black spots at points of injection. mouth [redacted] lining gray.

O. Riemer
1955

Taricha granulosa

8 Jan. W.V.Z.

Three animals marked by scratching pectoral epidermis with dissecting needle and rubbing on animal charcoal. In one case charcoal mixed with vaseline to form paste.

1955
W. Riemer

Taricha granulosa

8 Mar. M.V.2.

After this interval of time the remaining animals show either a poorly defined local discoloration near the site of injection or a rather complete suffusion of the injected pigment over the body surface. Injection of pigment — at least ink pigments — by means of hypodermic needle is hence not a suitable method of marking amphibians.

At least a month ago 3 individuals were marked by scratching the pectoral region ventrally with a dissecting needle and then rubbing in — both dry and with vaseline — a small of animal charcoal. At present two retain a lighter set of markings and in one only a light scar area remains. It is not known how frequently the animals have shed during this period.

Today a series of 10 were marked using a red hot dissecting needle applied flat to various portions of the body surface. In most cases a brand was made with a mere touch of the needle. In one young animal three ~~relatively long~~ marks are impressed into the basal region of the tail. Each was of relatively long duration — about ½ second. None of the animals reacted unfavorably except to flop the body on contact with the needle.

W. Riemer
1951

Triturus rivularis

4 Mar. Calif.: Sonoma Co. Just about the time we reached Skaggs Springs, approaching from the east, saw this species crossing road. Stopped about 0.5 mi west of town and collected series of 9. One of these taken from road the rest from base of grassy slope where slope almost reached stream. Where sandy bank between stream and slope very ~~broad~~ broad none seen. Some in open, others in shallow cave-like hollows in soil eroded by water. Stream swift and very muddy; about 30-50 ft across. Slopes approaching stream steep, wooded with various oaks (to 2 ft. in dia.), mostly small; grass cover about 6 inches; a few annuals now blooming. Weather, heavily overcast and raining almost constantly though lightly. Drove then almost to coast highway. On way saw more of this species while still at relatively low altitudes but none while climbing crest. Present also lower down on coastal side of range. Small group taken from various points on road between Skaggs Springs and Stewarts Point especially for Student collection.

W. Reimer
1951

Triturus rivularis

20 May Calif.: Mendocino Co., 4 mi. SW Ukiah, Robinson Creek. For description of stream see T. granulosus account. Larvae of this species currently hatching from egg masses attached to under side of stones in more rapid portions of stream. Many masses removed and brought back to hatch in laboratory. Hatched larvae appeared to remain sheltered beneath stones. Exposure to current would mean being swept downstream, often some little distance and over a rocky substrate. No adults found.

18 Aug. Calif.: Sonoma Co., 1 mi. W, ½ mi. N Skaggs Springs, Warm Springs Creek. One completely metamorphosed young taken among rocks of low natural rock dam ~~dam~~ through which moderate flow of water passed. Not determined where animal under a surface rock or under or among deeper submerged rocks. Intense search revealed no more. Under floating algal mats in the sun in 3 - 4 inch deep water several large larvae taken and also one apparently completely metamorphosed except that red blood engorged gills still present. Pigmentation basically as in adults ~~basically~~ in all other regards. Total lengths of larvae: 45 & 63 mm.

W. Reiner
1951

Taricha rivularis

18 Aug. Calif.: Mendocino Co., Robinson Cr., 4 mi S, 1 mi W Ukiah

Larvae abundant in shallow, 2-3 inch deep water with no or only slight flow. Usually associated with slight patches or wisps of green algae. Sometimes under small mats of leaves caught among rocks. One small quiet embayment — about 2 feet square — with 8-10 larvae. Very easy to capture with fingers; in this way much unlike those at Skaggs Springs which were very wary. A large series taken of which only one nearly metamorphosed. This post-larval animal looks different in facial pigmentation than those from Skaggs Springs. At 1745 hrs water 25°C. No adult Triturus seen and no young under rocks. Is it possible that the larvae were not hidden under algae because of time of day and because sun not shining on this area?

Larvae measured 22 Aug. for total length only: 39 mm (1 individual); 41 (1); 42 (1); 43 (1); 45 (3); 46 mm (1 individual); 47 (3); 48 (2); 49 (1); 50 (5); 51 mm (5 individuals); 53 (4); 55 (1). Average total length: 48.4 mm.

W. Reiner
1952
1953

Taricha rivularis

3 Feb. Calif.: Mendocino Co., Robinson Creek, 4 mi. S, 1½ mi. W Ukiah.
2 adults, (1 small one), under large Umbellularia on level shelf above stream. Stream 20 feet away. Smaller one between rocks & old campfire site. Larger one walking among the several trunks of tree on thick wet leaf litter. 1130 hrs. Sun visible but no shadows because of overcast.

1953
5 Feb Calif.: Sonoma Co., Wild Cattle Creek, ½ mi. S, 4½ mi. W Skaggs Springs. 800 ft.
Series of more than one hundred collected in 30-45 minutes. All ages, but mostly adults, all terrestrial, almost all walking on surface, a few half-hidden at the edge of logs. Most walking uphill (away from stream). Taken from very edge of stream to several hundred feet elev. up-slope. Search carried no farther upslope. Oak-madrone woods. Thick leaf mat, some also taken on open grassy slopes. Stream 3-4 feet wide with tumbling rapids. None of species in water. Water slightly murky. Weather cool, drizzling. Also a few T. granulosus taken mixed in with this species. ♂♂ rivularis with poorly developed cloacal swellings and but slight tail fins. ♀♀ look loaded.

W. Reiner
1953

Taricha rivularis

5 Feb. Calif.: Sonoma Co., Wolf Creek, 1 mi S, 9½ mi. W Skaggs Springs

Numerous adults walking about on moderately steep, grassy, oak-studded hills several hundred feet (600(?)) above canyon bottom. Most moving uphill, most in what would be shaded areas were seen out. Rarely under surface of objects. Open oak woodland, small rocky outcrops, logs and stumps abundant. Misty, cool.

8 Mar. Calif.: Mendocino Co.

See account of T. granulosus for this date.

9 Mar. Calif.: Sonoma Co., Warm Springs Creek, ½ mi. N, 1 mi. W Skaggs Springs A

Both rivularis and granulosus in stream, the former by far the more abundant though no count made. Stream clear with moderate flow. Granulosus found only in quiet water whereas rivularis in moderately rapid flow as well. Rivularis in amplexus, in one case 3 ♂♂ superimposed, a ♀ on the bottom. ♀ with white plug, a spermatophore?, in cloacal lips. Would expect granulosus to be ovi-laying also the ♂♂ being in full breeding condition. One pair taken in amplexus. 1300 hrs. side pool with one of granulosus 11½° C, stream 10½° C. Animals not abundant.

9 Mar. Calif.: Sonoma Co., Wild Cattle Creek, ½ mi. S, 4½ mi. W Skaggs Springs A

Saw only one granulosus but rivularis everywhere in stream. Water muddied. Light misty rain falling. A few on road.

W. Reiner
1953

Taricha rivularis

30 Mar. Calif.: Sonoma Co., Warm Springs Creek, ½ mi. N, 1 mi. W Skaggs Springs. 8 ♂♂, 2 gravid ♀♀ taken from stream. Water temperature 1200 hrs. 12½°C. Single granulosus taken from shallow side pool where temperature at same time was 22°C. Rivularis found only in shaded areas of stream where moderate flow present. Granulosus in quiet water in sun. Animals definitely not common. These 11 animals taken in half mile of stream. One egg cluster found in stage 27, under rock. Only about 6 embryos in cluster.

30 Mar. Calif.: Sonoma Co., Wild Cattle Creek, ½ mi. S, 4½ mi. W Skaggs Springs. Taricha rivularis abundant here; several almost constantly in sight. 1300 hrs. water temperature 12½° C. 1 small granulosus taken in stream and several large males in small isolated pool; amplexing going on. Water slightly milky. Current stiff. Rivularis always orient with head upstream. If current too strong they climb out on bank to walk around the rapids or falls. Most frequent quietest water available. Many amplexing. Several very gravid ♀♀ taken. It was seen from numbers of animals present at various times of year that granulosus competes with but poor success against rivularis, perhaps only because of stream nature of environment.

W. Reimer
1953

Triturus rivularis

30 Mar. Calif.: Sonoma Co., Wild Cattle Creek, ½ mi. S, 4½ mi. W Skaggs Springs, 800 ft. One of local ranchers says raccoons will not eat waterdogs. Frequently caught, mauled, mouthed and discarded. He knows of no predators. Says probably do not harm except muddy streams. Also, they forecast rain by appearing on roads.

30 Mar. Calif.: Sonoma Co., Mill Creek 1½ mi. S, 3 mi. W Healdsburg 325 ft.
Species abundant in main stream. Rocky sandy bottom, water ~~mud~~ murky. Stream 10-15 feet wide with many deep pools. 1600 hrs. water temperature 15°C. Redwood forest. This is new southern station to my knowledge.

30 Mar. Calif.: Sonoma Co., Porter Creek, 2 mi. N, 3½ mi. E Guerneville 300 ft.
Here, only a few miles south of Mill Creek and at same elevation as at Mill Creek there were no Triturus to be seen. Stream smaller, 4-6 feet wide, clear, rocky-sandy bottom, deep pools. Mostly oak-laurel forest with scattered groups of redwoods. Stream appeared ideal in all respects for Triturus, however considerable search at this elevation and at points downstream revealed no such animals. 1715 hrs. 12½°C. Either more redwoods desirable for proper habitat or animals do not range so far south.

W. Riemer 1954 Taricha rivularis

14 April Calif.: Sonoma Co., ½ mi. NNW Cazadero 250 ft. Vol 2 A
Single adult taken by Eugene ~~Holts~~ under boards at edge of ditch ~~with water~~. This, to me, is southernmost record near coast and is equal to mill creek locality near Healdsburg on valley side of mountains.

1 Nov. Stanford University
Seminar given by V. Twitty and attended by myself, Stebbins, Eakin, and Thurmond from Berkeley. by
Described mass hybridization experiment in Sonoma Co. using hatchlings of T. rivularis ♀ × T. torosa ♂.
First stream cleared as well as possible of T. rivularis, T. granulosa and small allowed to remain. About 1½ miles so cleared. Lower end of study area with apparently uninhabited (barrier ?) marsh while upper end with small tributary streams with much reduced populations. ♀♀ tested for eggs in ~~and~~ oviducts by stripping. Those showing eggs at cloaca opened, eggs removed from tubes, put in sperm suspension, removed, put in trays and no water added for 15-20 minutes. Sex ratio is different from normal 1:1. In stream studied 3200 ♀♀ taken from 1½

J. Rieser
1954

Taricha rivularis

1 nov. Stanford University

miles of stream in one season, 1600
♂♂ taken from 500 yds of same
area in one day.

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ed
small

y

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r

W. Reimer
1950
1951

Taricha torosa sierrae

1 Oct. Calif.: Shasta Co., Squaw Creek, Chimpchatter Camp

A color description of 6 specimens (without numbers yet) taken by Joseph Gorman
These animals basis of paper on range extension published in
Specimens have been maintained in extremely dry and foodless condition for several weeks and colors are not to be considered as typical.

Specimen	Dorsum	Venter	Remarks
1	8L2	11D11	
2	"	3B12	
3	8L4	6A12 ♂	body much distended and tail very short + small
4	8J5	3B12	
5	blackish-brown	11G12	
6	" "	4I12 (lighter on throat)	very thin

Specimens taken 12 June 1950 on dirt road (damp) by stream. Others in stream.

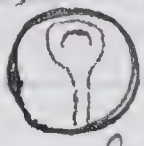
30 Apr. Calif.: Tuolumne Co., Sawmill Flat

Eggs from a ♀ taken at this locality by Bill Clark laid eggs in captivity on 25 March and a few days prior. 26 Mar.- several eggs with very evident cleavage stages (about 16 cells). 27 Mar.- cells now so small they are evident on only a few. 29 Mar.- eggs spherical with all cells too small to see with 12X lens.

Taricha torosa sierrae

W. Reiner
1951

30 Apr. Calif.: Tuolumne Co., Sawmill Flat

2 Apr.- Some in  stage. 5 Apr.- in many the neural folds almost closed in region of the head. Eggs losing spherical shape. 10 Apr.- About ½ of eggs are definite embryos while ½ are hemispherical globs. Kept until this ~~see~~ time (23 Apr.) eggs kept in cold room (about 13° C) but now removed to room temp and water aerated. No pigment yet but gills present. 30 Apr.- ½ of animals hatched now.

2 Sept. Calif.: Tuolumne Co., Woods Cr., 1½ mi SE Columbia

This is same locality as the one above. For larvae collected here on this date see journal of same date.

W. Reiner
1952

Triturus sierrae

2 Mar. Calif.: Butte Co., 6 mi. E, 1¼ mi. N Bidwell Bar, 2220 ft.
Cattle pond with no Triturus. Pond 20 x 20 feet, with much algae on surface and beneath surface, sedges below surface, situated in sloping pastureland in yellow pine, canyon oak woodland. Hyla eggs in abundance in pond both attached in tablespoon-sized masses to vegetation stalks and in dime-sized masses and smaller simply ~~flood~~ floating free on algae. Water temp. 1030 hrs. 11-12° C but in some spots with ice sheet on surface.

2 Mar. Calif.: Butte Co., 1¼ mi. E, 3 mi. S Bidwell Bar, 1380 ft.
No Triturus in reservoir on NE shore, on rock dam face or in drain and irrigation channels below dam. Water murky but still in reservoir, murky and with at least some quiet pools in ditches. Ditch water temp. 8° C at 1145 hrs. 1380 feet elevation. Scrubby oak woodland. None in natural cattle ponds 100 yds below dam. Hyla eggs abundant.

2 Mar. Calif.: Butte Co., ¾ mi. W, 1 mi. N Bangor, 700 ft.
No Triturus in small stream (3-6 feet wide) flowing moderately, with deep pools, flowing through rolling foothills covered with digger pine and oaks in semi-open stand. Elevation: 700 ft.

W. Riemer
1952

Taricha sierrae

2 Mar. Calif.: Yuba Co., 5.4 mi. E, 4.0 mi. N Bangor, South Honcut Creek

Stream 12 feet wide in rapids. Adult ♂ taken in crevices between ~~rocks~~ rocks & rocky stream bed pool. Rocks fist to head sized. All covered with brown algae and silt. Essentially no flow here at point of capture; water temp. 1545 hrs. 9½° C. Do they normally hid under rocks? Most difficult to see. Weather, clear sunny, bright. R. boylii also taken at same spot, running.

30 May Calif.: Butte Co., Butte Meadows

1 ♂ post breeding in slowly flowing shallow (3 inches) stream running through middle of elongate meadow area ~~adj~~ adjacent to highway. 1320 hrs. Water temp. 27° C. Meadow open, grassy with scattered yellow pine, incense cedar, Douglas fir. Semi-open surrounding forest of same species. Few small patches of snow remain.

31 May Calif.: Plumas Co. North Fork Feather River, Seneca

Subadult at edge of small quiet pool adjacent to main stream. 0740 hrs. Sun not yet to this place. Air temp 9° C water 7° C. No sign of breeding condition. Big leaf maple and willows. Adult ♂ in water at far edge of same pool with partially swollen cloaca. Appear to have emerged from under a rock.

♀ 75 feet above stream walking away from stream

W. Reiner
1952.

Taricha torosa

31 May Calif.: Plumas Co., North Fork Feather River, Sanaca

over clear, bare, ground in camp area. Gravid ♀. Adult taken at very edge of main stream under old automobile fender. Adult ♂ with partially swollen cloaca swimming near edge of large pool with quiet water adjacent to main stream. Five feet deep by 15 feet in diameter. Several taken along but not in tiny tributary rivulet, where flowing 1 inch deep, 2 feet wide. All on damp soil, usually at edge of rock, situation well shaded, 0915 hrs., bright, sunny, clear.

Eggs, apparently uncleaved, attached to broken edge of glass jar at bottom of pool exposed to full sun about half of day. Pool 12X20 feet by 6 inches deep, bottom essentially clean silt with only scattered debris. A few clusters appeared to be in jar but unattached to glass, i.e. free. Two other clusters nearby attached to wire 1 inch below surface. Though many sticks around none with eggs attached. 1 large ♂ taken from pool.

1 June Calif.: Eldorado Co., Webber Creek (nr. Shingle Springs)

Considerable search of many springs, streams and portions of main river along U. S. 50 failed to reveal any Taricha. In this creek found largely disintegrated egg cluster mass, all larvae having hatched.

W. Riemer
1953

Triturus sierrae

Calif.:

23 Mar. 1 Calaveras Co. and Tuolumne Co.

Most of one day spent in examining various spots in these counties for Rana boylii and Triturus sierrae. Viz: Angels Creek, ½ mi S, 1¼ mi. W Murphys. Stream examined without success last year also. Now with moderate to rapid flow but with occasional quiet deep pools. Cloudy water, about 9° C at 1100 hrs. No Triturus. Elevation 2000 ft. Camp Connell, 4.2 mi. NE Calaveras Big Trees State Park. Here ground completely covered by snow. Elevation 4800 ft. Stream clear, temperature 6½° C at 1300 hrs. No Triturus though no expected since impossible to move to stream to breed.

Calaveras
Big Trees State Park. Elevation 4600 ft. About one half of ground covered by snow. No quiet pools in precipitous stream bed, no Triturus seen. water temp. 7° C

1 Moran Creek, 2 mi. N, 6½ mi. E Sheep Ranch (town). Here only tiny patches of snow in protected places. Reservoir with temperature of 15° C examined. No Triturus. Reservoir appears to be relatively new and hence may not yet have built up a good population. Coyote Creek, ½ mi. N Vallecito. Willow bordered stream with clear water, deep pools, rocky bottom, 15° C. No Triturus. Appeared ideal. 1800 ft. Woods Creek, 1 mi. S, 1 mi. E, Columbia. No Triturus though Pat

W. Riemer
1953

Taricha torosa sierrae

23 Mar. Calif.: Tuolumne Co.

Clark's ~~reports~~ (a resident) reports having seen one in stream a week or 10 days ago. Elevation 2300 ft.

18 Apr. Calif.: Madera Co., O'Neals, 1350 ft.

Small stream in most places heavily shaded with cottonwoods and willows. Clear and quiet. at 1620 hrs. 18½-19° C. Flows through very open blue oak, digger pine woodland. Rolling hills. Eggs masses much discolored and difficult to spot. Few larvae remain unhatched. Enough ♀ masses collected to capture 10 larvae. Also abundant in stream were Rana aurora (large numbers), Rana boylei (moderate numbers), occasional Clemmys. No adult Taricha seen.

19 Apr. Calif.: Mariposa Co., 3 mi. NE Briceburg, Feliciana Creek. Small creek with deep pools. Stream here flowing through steep-walled rocky gorge. Water temperature 14-15° C at 1530 hrs. One pair in amplexus. Only eggs present were just beginning to hatch. Were attached to small roots in same way as torosa might do. Where pools carpeted with rocks animals made good use of such cover. Some of ♀♀ appear still gravid.

W. Reiner
1953

Taricha sierrae

1 May Calif.: Eldorado Co., Webber Creek

3 gravid appearing adult ♀♀ taken from deep 3 ft+, quiet pool near main stream. Only ones seen in several hours of searching were in this, the only large quiet pool. None in main stream probably because of rapid flow. Recent rains & probably last evening have raised stream above any recent levels and also made stream murky. Water temperatures at 1400 hrs: 13–13½° C. Plants present include: Digger pine, yellow pine, oaks, alders, madrone. Pine-oak forest with yellow pines dominant locally.

2 May Calif.: Eldorado Co., 2½ mi. E Pilot Hill

Small (6 ft.) stream flowing through rocky outcrop area had no Taricha. Occasional deep (3 ft.) pools of quiet water. 11° C, crystal clear. Rock and gravel bottom. Yellow-pine–oak woodland with occasional digger pines. At 0700 hrs. air 4° C.

2 May Calif.: Butte Co., 3 mi. S Magalia

A small tumbling stream through yellow-pine forest. Young fisherboy claims to has seen one being swept downstream in considerable current.

2 May Calif.: Butte Co., 1 mi. W E Desabla

Caretaker at powerhouse in canyon bottom

W. Riemer
1953

Triturus sierrae

2 May Calif.: Butte Co., 1 mi. W Dasabla

claims large numbers to be present in morning and after rains in sluiceway flowing above river. Water flows through this ditch at 8-10 feet per second. None were present in quiet pools at edge of main stream. Water temp. of pools, 11° C.

2 May Calif.: Butte Co., Centerville

Examined edge of main stream and one deep (6 feet or more) still pool separated by tailing (?) piles from stream. Enormous numbers of tadpoles present. No Triturus. Rocks, submerged sticks, deep quiet water at suggest this as an ideal spot for the animal.

3 May Calif.: Shasta Co., 1 mi. NE Bugot

See T. granulosus for account of this date.

W. Riemer
1954

Triturus sierrae

3 Feb. Calif.: Tulare Co., 2 mi. W California Hot Springs, Deer Creek

Dick Russell collected two adult ♂♂ from stream, saw two other adults. This is farthest south species has been collected. Both have weakly developed breeding pigment on soles and thighs.

W. Riemer
1948

Triturus torosus

10 Apr. Wildcat Canyon, Tilden Park, Contra Costa Co., Calif. Walking over very wet ground near stream. Has been raining for several days.

24 Apr. Two found at bottom of cement cistern. Both in very emaciated condition.

1949

5 Mar. Pinehurst, Contra Costa Co., Calif. #09 when found at 1335 within 1-2 ft. of point of original capture, in stream. Very pale tan dorsal color, seemingly much paler than before. Palmar and plantar surfaces as well as posterior portion ventral surface of thigh pigmented dirty brown. Toe tips deep brown. Cloaca very swollen. 10 minutes later attempting to climb bank, almost perpendicular. Tail follows all irregularities of ground often acting as prop while both rear legs off ground. Climbed 6 ft. up bank before falling backward when attempting an overhanging clod. Fore feet clawing at sopping wet and loose soil. Hind legs working in air. Entire body

W. Reiman
1949

Triturus torosus

5 Mar. Pinehurst, Contra Costa Co., Calif.
supported by terminal half inch
of tail. Fell to 4 ft. and continued
downhill at an angle for one
foot, then sharply turned uphill
again in new place. Could
this be device to provide new
pathway each time animal
fails? Paid no attention to &
placed close by during any of
this time.
#15 caught swimming in stream
and clinging to attached twig
with hind limbs. Stout and
apparently full of eggs. Placed
on bank next to ♂ #09 (above).
Paid no attention but after being
on bank for sometime, during
which climbed intermittently,
thrown back into water. Immed-
iately returned to bank to
start climbing again.

25 Mar. Tilden Regional Park, Contra Costa Co., Calif.
♂♂ seem to be found principally
at those places in stream where
there is a small amount of
current and avoid areas of still
water or strong current. Do not

W. Riemer
1949

Triturus torosus

25 Mar. Tilden Regional Park, Contra Costa Co., Calif.
seem very adept at moving against
much of a current unless a rough
firm substrate on which to "walk"
is present. One animal noted
attempting to work upstream
in relatively narrow, sandy
bottomed channel. Forward
movements by lateral undulations
of short duration; then a foot-hold
on substrate sought. Such
foot-holds too readily lost in
sand and animal swept down
stream for short distance.
Many attempts, but no substantial
progress made. Every twig and
projecting object clung to in
attempt to resist current.
When caught in current too strong
to move against, often resort to
movement at right angles to
current. Very apparent tendency
to avoid full sweep of current
and to work constantly (?) upstream
by "walking" on bottom using
all available handholds. In
one instance two ♂♂ noted
walking upstream at edge of

W. Riemer
1949

Triturus torosus

25 Mar. Tilden Regional Park, Contra Costa Co., Calif.

water but on land, possibly to avoid very swift current of adjacent water. Both in full breeding condition, and this is also indication ♂♂ do leave water on occasion while in breeding condition. Of ♀♀ found, 3 in water in amplexus, 2 very close to water but seemingly just arriving. 1♂ former and both ♂ latter heavily laden with eggs. The very gravid ♀ in water, was center of swarming mass of 6-7 struggling ♂♂. Suspected that ♂♂ attracted to other sex in water by smell. Eggs found attached to sticks about pencil diameter and in moderate flow of water at edge of stream. One cluster actually entirely out of water. May be result of receding water level or an undetermined accident. When animals placed in aquarium in lab almost immediately all were paired and in amplexus. ♀♀ all reacted negatively and 8

W. Reimer
1949

Triturus torosus

25 Mar. Tilden Regional Park, Contra Costa Co., Calif.
hours later only occasional pairs amplexing. Some factor of capture or confinement appears to have disturbed ♀♀.

26 Mar. M.V.Z.
Amplexing of animals above discussed was sharply renewed this morning when clear fresh water substituted in aquarium. Disturbing factor for amplexing may be simply dirty water or ♀ odors may so saturate water ♂♂ become desensitized or at least unattracted.

2 Apr. Pinehurst, Contra Costa Co., Calif.
5 clusters of eggs at 3.4-6.4 grids in upper area. 2 clusters 10.5 cm below current surface of water, 3 clusters 14.0 cm below surface. All clusters here attached to under side of small twigs approx. 5-7 mm. in diameter. Water very quiet, clear, and clusters essentially not exposed to real current. All clusters appeared small though numbers of eggs not determined.

W. Riemer
1949

Triturus torosus

2 Apr. Pinehurst, Contra Costa Co., Calif.
Situated so that largely protected from direct lighting by bank overhang. Eggs appeared spherical. At 1.6 - 5.7 in upper area single cluster on short twig wedged among rocks. Apparently washed down from above. Water at that point swift and shallow. Just below surface. Eggs spherical. At 1.4 - 3.9 in upper area, 3 clusters. 1 (the middle one of twig) in process of being laid and jelly not yet swollen. In rather rapid flow at edge of stream.

9 Apr. Egg clusters at 3.4 - 6.4 (see 2 Apr. last week) now 15. Can not detect development because of silty film over surface. All but one cluster on lower side of limbs. Depths 9 & 12 cms. Cluster at 1.6 - 5.7 (see 2 Apr.) shows no obvious signs of development. Clusters at 1.4 - 3.9 (see 02 Apr.) 5 now. All probably laid by same ♀ and show no obvious development. 103.2 - 2.4 has single small cluster.

W. Reiner
1949

Triturus torosus

9 Apr. Pinehurst, Contra Costa Co., Calif.
Appears newly laid. 13 cm below surface. Only cluster seen thus far in lower area.

16 Apr. Eggs at 3.5 - 6.4 (formerly called 3.4 - 6.4) now 6½ - 10½ cm. below surface. Eggs appear small, spherical & undeveloped. Eggs at 1.6 - 5.7 developed to elongate stage. Cluster also appears to be tearing loose from stick. Eggs at 1.4 - 3.9 just becoming pointed. At 103.0 - 5.4 single small cluster in quiet well shaded water. 10.5 cm. below surface. 103.2 - 4.5 single cluster with no sediment film ~~indicating~~ suggesting it being laid during week. (In working up-stream each week considerable sediment stired up). 6.5 cm. below surface in quiet water. Attached to under side of twig. Probably exposed to direct sun light during part of day. Exposed position makes it difficult to believe its being overlooked in previous weeks yet eggs developed almost to elongate stage. 103.1 - 4.3 single cluster 12 cm below surface. 103.2 - 2.4 cluster present last week

W. Reimer
1949

Triturus torosus

16 Apr. Pinehurst, Contra Costa Co., Calif.
not covered by sediment which might indicate cluster noted above older than suspected. Another sediment covered cluster at same spot.

23 Apr. Eggs at 103.2-4.5 quite elongate though no features apparent. 6 cm. below surface. Not covered with silt, indicating that some clusters may not collect ~~silty~~ silty film, silty water did not reach cluster, or idea that it was new cluster last week was erroneous. Eggs at 103.1-4.3 elongate and 14 cm. below surface. Two new clusters (now 4) discovered at 103.2-2.5. Probably not newly laid. Two without silty film and elongate in development. Large silty one still elongate. 4, 5, 8, 13 cm. below surface. 18 clusters at 3.5-6.4 all approaching or at elongate stage. Eggs at 1.4-3.9 all elongate. No cluster could be found at 1.6-5.7 and probably washed away.

7 May Eggs at 103.2-2.5 very elongate. Only 3 clusters found. 2-13 cm. below surface.

W. Riemer
1949

Triturus torosus

Pinehurst, Contra Costa Co., Calif.

7 May Eggs at 3.5 - 6.4 at very elongate stage
an appear to have less silty
film than formerly. 1.4 - 3.9 clusters,
except one, gone; that one at
surface of water.

15 May ~~Eggs~~ Embryos at 103.2 - 4.4 now with eyes
and longitudinal pigment stripes.
Appear ready to hatch very soon.
Embryos at 103.2 - 2.5 - 3 clusters
appear to have no pigment as yet.
Embryos at 3.5 - 6.4 as shallow as 3.5
cm. Some with eyes but no
body pigment apparent. Clusters
at 1.4 - 3.9; = 2 of 3 clusters broken
apart. Remaining one with embryos
with eyes and lateral pigment stripes.
Adult ♂ #55 with brown-tipped
tubercles on ventral surface in
following pattern. Concentrations
about angle of jaws and below
pectoral girdle. Scattered tubercles
along edge of lower jaw, along
ventro-lateral edge of abdomen
and these two lines meeting below
pelvic region.

18 May During road survey after heavy rains
on this date, following observed. Juvenile
on road in last stages of swallowing

W. Riemer
1949

Taricha torosa

18 May Pinehurst, Contra Costa Co., Calif.
earthworm. An adult, unidentifiable as to sex DOR at 3.5-1.7 grids and facing away from stream. Had been killed prior to 2000 hours. Unmarked juveniles DOR taken at night at Point #1, Point #2, Point #3. Unmarked adult, sex undetermined, taken at Point #2. Five Amicides, adult taken at Point #3 out of area 1 and subadult at Point #4.

21 May Cluster at 103.0-5.4 well developed. Cluster at 103.2-4.5 appears ready to hatch. Adult ♂ in immediate vicinity. Cluster at 103.1-4.3 well developed. Five present at 103.2-2.5 and all well developed. Eighteen at 3.5-6.4 either well developed or ready to hatch. Cluster at 1.4-3.9 ready for hatching. Expected some will hatch during week.

28 May Of clusters at 3.5-6.4, no young appear to have escaped. Shallowest at 5 cm. Few jelly masses with sediment. A snail on one mass perhaps cleaning it. Cluster at 1.4-3.9 at surface. Several young seem to have left but could

W. Reiner
1949

Tritunis torosus

Pinehurst, Contra Costa Co., Calif.

28 May not be found on bottom in vicinity. However, rather steady current here. Location (exposure to light and rapid flow, hence more oxygen) may be reason for more rapid development of this cluster. Clusters at 103.2 - 2.5, 103.2 - 4.8, 103.0 - 5.4 all appear ready for hatching though no indication of such as yet.

04 June Clusters at 3.5 - 6.4 about 3/4 hatched. Rest surely out within week. At 1.4-3.9 all but 3 or 4 larvae in very center of cluster hatched. 103.0 - 5.4 all hatched and 3 larvae within 6 inch radius of cluster on bottom in about 6 cm. of water. 103.2 - 4.5 all of cluster hatched. Several larvae on shallow sandy bottom within two feet of cluster. 103.1 - 4.3 all hatched. Two larvae in main part of stream but in shallow water. Still with much yolk. Measure about 15 mm. 103.2 - 2.5 unhatched except for a possible few. Two adults in area. 103.2 - 2.2 newly noted cluster. Ready for hatching. 11 cm. below surface. Because of location might have been laid much deeper.

W. Riener
1949

Trituris torosus

11 Jan Pinehurst, Contra Costa Co., Calif.
3.5-6.4 all appear hatched. Several noted on bottom at depth of 22 cm. in vicinity of clusters. Jelly showing signs of disintegration. 1.4-3.9 all hatched and jelly disintegrating. 2 larvae seen few feet below cluster, none seen above. In presence of even slight (visible) current larva could not long retain grip on bottom. Small fish which could easily have taken larva did not do so even though within 1 in. for several minutes. Locations of all known clusters in lower area checked. All larvae hatched. 103.2-2.5 larvae still with some yolk and considerably smaller than older ones. 103.2-2.2, jelly very clear last week before hatching but now cloudy. No adults in area. Could imminent hatching of larvae provide a stimulus for adults to leave water in vicinity? 102.0-2.1 a region where no adults ever taken and no clusters known has no larvae now.

W. Riemer
1949

Triturus torosus

24 Sept. Calif., Contra Costa Co., Pinehurst The following measurements of larvae made on specimens taken at random from pool at exit of large drainage pipes near road fork. Total length 21 mm., 22 mm., 26 mm., 31 mm. These larvae are extremely immature it would seem, for the first heavy fall rains are to be expected within three week or less. Such larvae, from 1/2 to 1/3 the size of the species at metamorphosis, cannot possibly metamorphose before the stream is again turbulent with the winter rains. How can they withstand such flushing of the stream and when will they take up a terrestrial existence?

The pool in which a larva seen last week is now gone entirely, with a very soft muddy spot only yet remaining. Did that larva die with the disappearance of the free water or could the animal have buried in the mud in an attempt to span that period until more free water is present?

W. Riemer
1949

Triturus torosus

24 Sept. Calif., Contra Costa Co., Lafayette Reservior

In a small wind sheltered cove just beyond the W end of the dam a small 18" X 4" X 4" board at edge of water turned over. Sixty-one newly metamorphosed young under this single board. A few other boards in vicinity but on drier ground with fewer specimens. However other boards in exposed areas — places lapped by 3-4 in. waves also with "hoards" of this species beneath. Prevailing winds would appear to blow from across lake toward dam — they were blowing that direction at time of visit — for large mats of dead cattail stalks had accumulated at ends of dam. Such mats just beneath dry surface stalks fairly seething with young Triturus. No estimate of number could be made except that almost pure handsful could be scooped up throughout these mats. The 61 specimens taken under board marked and placed again under board. The following data taken on 25 of the

W. Riemer
1949

Triturus torosus

24 Sept. Calif., Contra Costa Co., Lafayette Reservoir

61 marked.

	Body	Total	Dorsal stripe	Gill Stubs	Toe clipped
		tip broken			
1.	33 mm	59 mm	present	present	0 200
2.	33	64	"	"	0 200
3.	26	50	absent	"	0 300
4.	35	65	"	"	0 200
5.	31	58	"	"	0 200
6.	34	65	"	"	0 200
7.	34	64	"	"	0 200
8.	30	58	"	"	0 200
9.	33	64	"	"	0 200
10.	34	68	"	absent	0 200
11.	34	64	"	present	0 200
12.	33	61	present	"	0 200
13.	32	60	absent	"	0 200
14.	33	60	"	absent	0 200
15.	36	69	"	present	0 100
16.	32	69	"	"	0 200
17.	33	63	present	"	0 200
18.	33	63	absent	absent	0 200
19.	32	59	present	present	0 200
20.	31	57	absent	absent	0 200
21.	35	63	"	present	0 200
22.	34	63	present	"	0 200
23.	36	67	absent	"	0½00
24.	35	66	present	"	0 200
25.	34	64	absent	"	0 200

W. Reimer
1949

Triturus torosus

24 Sept. Calif., Contra Costa Co., Lafayette Reservoir

All 61 specimens marked by clipping the toes of the right forefoot — toes 1; 2, 3 counting from the inside out — so that specimens between 25-30 mm in body length (snout to posterior edge of vent) had toe 1 removed, those between 30-35 mm toe 2, those above 36 mm. with toe 3 removed. The largest specimen recorded was: body 39 mm., total 73 mm, gills present as stubs. Water temp. in same cove described above 24.6° C. Perhaps this relatively warm temp. is what enabled these Triturus to mature so rapidly compared to those at Pinehurst. What factor is responsible however for fact that all larvae metamorphosed at one time when each exposed to a different environment and physiological makeup since eggs laid? Could past week of hot weather be responsible for final stage of development? If so do animals require such a stimulus to complete development together as was apparently the case here?

W. Riemer
1949

Triturus torosus

24 Sept. Calif., Contra Costa Co., Lafayette Reservoir
Noted that water-boatmen extremely abundant throughout at least littoral portions of lake. Group of 53 young Triturus taken at dam as a sample of size at metamorphosis.

1 Oct. In same sheltered cove that 61 specimens marked last week under a single board, the following specimens marked today:
35 animals under board A with toes 1000 removed (i.e. inner toe left forefoot) Of these none were members of group marked last week, though all those marked last week from under board A also. 80 marked under board B with toes 2000 removed. Board only 18"X11" and also sheltered colony of common house(?) ant. Two of this group apparently from 0100 group of last week (5V over 35 mm.) Four of group from last weeks 0200 group (35 mm 5V down to 30 mm.) 25 marked under board C in 3000 series. 27 marked under board D with toes 4000 removed. Others present in interstices of soil

W. Riemer
1949

Triturus torosus

10 Oct. Calif., Contra Costa Co., Lafayette Reservoir and cattail stalk mat over entire ground. Such animals not marked. Does fact that so few of last weeks animals still present mean that they have moved elsewhere as part of a behavior pattern or have they simply wandered off? Where have these new animals come from? Have they newly metamorphosed? It would seem so since many possess gill stubs yet.

7 Oct. Calif., Contra Costa Co., Pinehurst Small amount of rain, 0.03 in., during week did not cause ground to be dampened and did not prevent further drying of stream puddles. At points 1.2-3.4 and 2.3-6.1 small murky puddles remained. Possitively no larvae were present. No water expected nor seen in greater mile tour upstream. Pool beneath drains near road junction considerably smaller now. Larvae present as well as two Rana boylii. Temp. of water 9.5° C; air 14.2° C. By way of cover additional boards placed in area.

W. Riemer
1949

Triturus torosus

7 Oct. Calif., Contra Costa Co., Lafayette Reservoir
284 newly metamorphosed larvae marked by removal of toe 400 (outer toe right forefoot). Under Board A 51 marked including one in 1000 series, one in 100 series. Under Board B 168 marked including 26 in 2000 series, 2 in 1000 series, 2 in 4000 series, 1 in 3000 series, 2 in 2200 series, 1 in 2100 series, 1 in 100 series. Under Board C 17 marked; all new. Under Board D 48 marked of which 1 in 100 and/or 200 series.
Observed at least 5 specimens, from waters edge to 1 meter from shore, dried to greater or lesser extent and with back cut open just behind insertion of forelimbs. Could this be result of attack by mud hens? Small Thamnophis elegans in crawling through area in which I was working took no heed of a young Triturus thrown into his path. Are they not predators?

15 Oct. Calif., Contra Costa Co., Pinehurst Absolutely no water remaining in stream bed for at least one-quarter mile above upper area to one-quarter mile below lower

W. Reiner
1949

Taricha torosa

150 ct. Calif, Contra Costa Co., Pinehurst area except for the pool beneath drain near intersection of roads. Even this pool is rapidly shrinking now though larvae are still present. One ♂ R. boylii present (?) but not seen. In upper area a single subadult ± 18 taken under board on damp ground at bottom of pit where animal was seen last spring almost every week. It seems likely the creature can't climb the perpendicular wooden walls nor escape by any other means. Stebbins claims Ensatina have escaped.

In the lower area more surface litter in the way of boards and planks was scattered about. Since no animals are now abroad on the dry surface it should not interfere with the population present except to increase the amount of suitable available cover for the coming season. A photograph, in color, was taken of the stream and banks with the camera placed at 103.2 - 5.3 and pointed almost due N. This is first of a projected series of one picture

W. Reiner
1949

Triturus torosus

15 Oct. Calif., Contra Costa Co., Pinehurst each month to show seasonal changes of the habitat. Picture is identified as Roll 35-2 Ex. in personal file.

15 Oct. Calif., Contra Costa Co., Lafayette Reservoir
This week examined only boards A and B. All under board A marked as ~~in~~ 300 series, 118 # in all. 26 were 400 series recaptures from last week. One from 1000 series. Two specimens given individual marks since they had been captured at least twice before. These now are #1 and #2. From under board B, 142 ~~120~~ specimens taken and marked in 4000 series of which one in 2000 series and 22 in 400 series. 23 specimens given individual markings, # 3-25. Because of limited time about one dozen released which should have received individual markings but did not. The number of newly metamorphosed animals is apparently dropping off now. Is this partly because of the cooler weather or have most of them already left the water? Weather today, clear, fair, warm.

W. Reiner
1949

Triturus torosus

220ct Calif., Contra Costa Co., Pinehurst Stream in canyon still trickling over most of distance between Canyon School and point where road leaves canyon bottom above lumber mill. Brief examination however at several spots revealed no larvae or any really suitable pools for them. Trout were still present. In study area itself the pool below the drains now shrunk to 3 x 4 ft. Murky. Larvae few and sluggish. One found was aerated. Found and marked one animal under board, #70. Water temp below drains 4.2° C, air 10.0° C.

220d. Calif., Contra Costa Co., Lafayette Reservoir See journal, this date, for new plan & procedure in this area. 148 specimens all from under Board A marked as 0011. Of these 99 new animals, 49 recaptures with the following toe formulae.

A	B	C	D	
2	3+4	0	0	- 1
2	1+4	0	0	- 1
2	0	0	0	- 2
1	4	0	0	- 2
1+2	0	0	0	- 1
1	1+2	0	0	- 1

A	B	C	D	
1	0	0	0	- 1
0	4	0	0	- 20
0	3+4	0	0	- 15
0	2	0	0	- 4
0	1+3+4	0	0	- 1

W. Riemer
1949

Tricturus torosus

29 Oct. Calif.: Contra Costa Co., Lafayette Reservoir
Under Board "A" 61 young were taken which had been marked last week as 0011. A total of 165 handled. 104 animals were marked as 0012 although certain of such animals had previously been marked in the following proportions:

				no. of animals	
2	0	0	2+3	1	Temp. under
3+4	0	0	0	1	Board "A"
0	3	0	0	1	22.2° C
0	1	0	0	1	
3	0	0	0	1	
1	4	0	0	1	
2	4	0	0	3	
4	4	0	0	8	
0	4	0	0	14	

5 Nov. Total of 227 animals handled. 208 of these newly marked as 0013, 13 recaptured from last week's 0012, 7 recovered of 0011 group. 2 of 0012 (all of which were marked under Board "A" taken under "D" and 1 under "B". Some wandering is apparent but for short distances only. The following previously marked specimens noted

				no. of animals
4	4	0	0	30
4	34	0	0	1

W. Riemer
1949

Triturus torosus

5 Nov. Calif., Contra Costa Co., Lafayette Reservoir

A	B	C	D	no. animals marked
4	4	5	0	1
2	4	1	2	2
2	34	1	1	1
2	4	0	2	1
2	4	0	0	3
2	4	0	4	2
24	4	0	0	1
2	4	23	0	1
2	24	0	0	1
2	4	0	5	1
2	4	2	1	1
2	4	0	1	1

A	B	C	D	no. animal marked
2	0	0	0	1
12	4	0	1	1
1	4	0	0	1
0	4	1	2	2
0	4	0	0	18
0	14	0	0	1
0	124	0	0	1
0	34	0	0	1

It was noted that several specimens still had weakly brown pigment dorsally and still had gill stubs. This means that some are even yet emerging from the water.

One specimen in a defensive reaction curled backward so that head and tail tip almost touched. Complete rigidity was retained for several minutes.

9 Nov. Calif., Contra Costa Co., Pinehurst During evening survey of road adjacent to study area made. The following specimens, all DOR unless otherwise noted, observed at the indicated point on road. (See map).

W. Reiner
1949

Triturus torosus

9 Nov. Calif., Contra Costa Co., Pinehurst

Location on road	S-V length	Remarks
21.9	60 mm	
23.6	75 mm	
24.6	45 mm	
"	45 mm	LOR - moving away from stream
25.3	———	Ensatina - moving toward stream
26.8	50 mm	
26.9	80 mm	
27.0	45 mm	
27.9	75 mm	
31.7	50 mm	
34.3	80 mm	
34.6	45 mm	
34.7	75 mm	
35.4	———	
36.6	70 mm	
36.8	70 mm	
36.9	———	Ensatina - moving away from stream
38.7	45 mm	
38.9	60 mm	
39.0	———	Aneides - moving toward stream
39.6	———	
"	40 mm	
40.5	———	
"	———	
"	43 mm	LOR - moving parallel to stream
40.6	50 mm	
43.3	51 mm	LOR - " " " "
43.4	———	Aneides - moving toward stream
44.0	70 mm	LOR - moving toward stream
44.5	40 mm	

There is obviously no great activity at time of survey. Were animals out in greater numbers earlier in evening to account for so many being DOR?

19 Nov. Two to 2½ hours spent in thoroughly examining study area. Two specimens # 75-76 marked. No others seen. No count on Ensatina or Batrachoseps. At 1030 hours water 7.6° C; air 8.2° C taken at 103.2 - 2.3. Water clear and flowing gently. No further rains.

W. Riemer
1949

Triturus torosus

26 Nov. Calif., Contra Costa Co., Pinehurst 0845-1130 spent in area. 1000, air 12.0°C, water 8.6 at 103.2-2.3. Stream still flowing and clear. Soil damp in all places except under larger pieces of wood in level spots or where protected by trees overhead. Leaf fall during past week very heavy leaving ground well blanketed with yellow leaves. # 77-82 marked. No recaptures. 8 Ensatina, 23 Batrachoseps noted. # 77 replaced besides half buried piece of stump after marking. When reexposed a minute later only head protruding from rodent burrow in soil. This suggests strongly that such burrow is a favorite retreat.

27 Nov. Calif.: Santa Clara Co., Saratoga, Campbell Cr. Single specimen taken while walking in open on wet leaf litter. 1350 hours. Spot well shaded. Walking toward stream, 20 ft. away. Rather extensive search along stream and under surface litter produced no other animals. Specimen taken has peculiar growth on ventral side of pelvic girdle. A parasite embedded?

W. Reiner
1949

Triturus torosus

27 Nov. Calif.: Santa Clara Co., Los Gatos Cr., Los Gatos
Single specimen taken under soaked pair of abandoned pants on gravel bank of stream. 4 ft. from stream. 1545 hours. Further search revealed no animals.

3 Dec. Calif.: Contra Costa Co., Lafayette Reservoir
0900-1000 hours spent in area. Board A with single animal now marked as 0-0-1+2+3-4 put it in 00 1 4 group. None others present. Boards A and D had been moved. Cover #1 & #2 produced 1 and 2 specimens respectively. Both of these pieces of cover well up hillside. All animals judged to be this years young. One with suggestion of gill stubs remaining. More litter spread about.

3 Dec. Calif.: Contra Costa Co., Pinehurst 1100-1215 spent in area. No Triturus found. 1145, air 10.5 °C, water 8.0 °C. Fallen leaves much more abundant than last week.

8 Dec. Calif.: Santa Clara Co., Los Gatos 1200 hours a young specimen taken among stalks of ivy at edge of water of small pond on "Vandenburgh Place" at end of Madrone Ave. Pond is much too deep for wading except

W. Riemer
1949

Triturus torosus

8 Dec. Calif.: Santa Clara Co., Los Gatos at very edges and only there with difficulty. An estimated 6 or 8 adult animals of this species (?) in pond and all appear in full breeding condition. One pair in amplexus. Gorman reports one pair in amplexus last Sunday ie. 4 Dec. Gorman is M.V.Z. student. Indentity on basis of very yellowish dorsum and lack of differentiation between dorsal and ventral color. All attempts to capture an adult in vain. Noted that juvenile taken, well supplied with brown-tipped tubercles. Water 11.4° C, with 60-70% canopy.

8 Dec. Calif: Santa Clara Co., 4 mi. W Saratoga On steep well forested (conifers and broad-leaves) slope, 400-500 feet above canyon bottom took one juvenile a few inches from adult Ensatina. Rain has not been heavy enough to soak soil beneath many logs. In such places soil and wood almost powder dry. Batrachoseps common under damper pieces. 1430-1450 hrs.

8 Dec. Calif.: Santa Clara Co., vicinity Saratoga Searched along Campbell Cr. both just above town and (approx. 2 mi.) several miles further upstream at Sanborn rd. (Longbridge). No animals found. Water about 10° C. None under litter

W. Riemer
1949

Triturus torosus

8 Dec. Calif.: Santa Clara Co., Stevens Creek, 3 mi. S, 2 mi. W Cupertino At and near junction of Mt. Eden and Stevens Creek rds several adult and young Triturus taken. 1645–1715 hours. Dusk. Road both wet and dry, paved and dirt. Moving both toward and away from stream. Those close to stream moving toward same, those at a distance moving away. Most abundant in immediate vicinity of stream. Here vegetation sycamore oak woodland. One adult in chaparral grassland habitat. Very young Bufo boreas common also

18 Dec. Calif.: Marin Co., 3 mi. W, 1 mi. N Las Gallinas Single adult ♂ taken on roadway. Road wet from rains, shaded. Tends toward breeding condition. Upper eyelids slightly lighter than dorsum. Tail with slight fin. Cloaca slightly swollen.

18 Dec. Calif.: Marin Co., 0.8 mi. W Point San Quentin In morning noted fair number of animals DOR on road. During evening check of road took two adults, 1 subadult. All 3 on road, raining lightly. Open treeless grassy hills. As road drops down to edge of bay no more DOR's seen. Where do these animals breed?

W. Reiner
1949
1950

Triturus torosus

18 Dec. Calif.: Marin Co., 0.8 mi. W Point San Quentin

Suspect that only available water on restricted grounds of prison if any present at all.

18 Feb. Calif.: Contra Costa Co., Lafayette Reservoir

On 16 Feb. 1950 captured melanin-less subadult. Animal taken home to be raised and possibly breed. Placed in terrarium with 3 small Bufo boreas. Temp. varies in terrarium between 60-70°F and receives light of north window. Triturus now 50 mm S.V. and 92 mm. total length. Did not take Drosophila nor other insects introduced as food though it may not have had a chance with "eager" toads present. Did however entirely and immediately tackle and consume a half-grown Batrachoseps attenuatus. Does this mean that Batrachoseps is an item of diet for Triturus in nature. If so, where the Batrachoseps population is high there such be few Triturus and conversely where Triturus abundant Batrachoseps such be scarce. Such is roughly true in Lafayette where Triturus abundant and in Pinehurst where Batrachoseps common.

W. Reiner
1950

Triturus torosus

17 May Calif.: Contra Costa Co., Pinehurst. 15 egg clusters counted in quick search about pool at 103.2-2.2. All attached to under side of small roots, stems or twigs about diameter of a lead pencil or smaller. At present between 1 and 10 cm below surface of water. One cluster appeared to be hatched and one or two larvae escaped from another cluster when disturbed. One very young Triturus, of the size of emerging ones from Lafayette, found in rotten wood on ground under piece of bark. Lack of gill stub scars indicates animal has been out of water several weeks at least but since all water except one tiny puddle disappeared last summer before the larvae could metamorphose the question arises; where did this animal come from? Has it only emerged from the water very recently?

25 May Calif.: Contra Costa Co., Lafayette Reservoir. While checking study area noted large numbers (in spots, one or more per square foot) of this species on and near concrete dam where dam drops under water with about 20° pitch. Most of concrete bare but dense growth of green filamentous algae at depth of 2-3 feet. Animals both on algae and concrete but saw none

W. Riemer
1950

Triturus torosus

25 May Calif.: Contra Costa Co., Lafayette Reservoir

on silty shores adjacent to dam. Water clear and broken on surface by wind driven waves of one inch height. Water below surface apparently quite still and no animal at less than 4-6 in. depth. Young drown sallows not yet fully feathered common at edge of water. Some of animals still pale skinned and appear smooth but most dark dorsally with dark tipped tubercles below. Water at dam 19.6°C

30 June Calif.: Contra Costa Co., Pinehurst Water still flowing slowly in study area and larvae in evidence at least at site where egg clusters laid this season. Larvae not obviously larger than when area last visited. No water or air temp. taken. Many fish present up to about four inches. In this very superficial visit a single juvenile specimen seen at edge of water in well shaded area. Not marked. Hot, dry, weather. A Thamnophis taken at edge of stream at short distance below where larvae seen.

30 June Calif.: Contra Costa Co. Lafayette Reservoir

Small larvae still present in cove where noted last visit and none evident near

W. Reiner
1950

Triturus torosus

30 June — Calif.: Contra Costa Co., Lafayette Reservoir
stands of cattails in same cove. Young of Hyla regilla very abundant. Large larvae abundant along face of dam where adults were so common several weeks previous. Why should larvae here be so much more advanced? Warmer water? More food?

13 Aug. — Calif.: Los Angeles Co., Millard Canyon
17 specimens (adult) taken by R. Stebbins on 28 June. See his notes for details. R.C.S. #4802-4809 8 specimens preserved immediately for record of development of gonads. 9 specimens kept alive and colors recorded this date. R.C.S. #4793-4801: Maerz and Paul colors; 9L6 (3), 10L6 (2), 9L7 (2), 10L7 (2), on ~~mid-venter of back~~. On mid ~~venter~~ dorsum, 7E12 (1), 7H11 (1), 7H12 (2), 8L2 (4), 8L3 (1). First two of dorsal colors on subadult specimens. Animals taken behind rock (of a pile) on stream just below dam. Clustered in small cavity. Others wandering on surface at edge of stream in early morning.

23 Sept. — Calif.: Contra Costa Co., Pinehurst Stream bed & study area dry except of small pools at 103.2-2.3 and 103.0-5.4 and larger pool beneath drain pipes. No larvae

W. Riemer
1950

Triturus torosus

23 Sept. Calif.: Contra Costa Co., Pinehurst seen except in pool beneath drains. Larvae 20 - 30 mm in total length (less than one half grown) and abundant. Pool 12 ft. in diameter. Two juvenile specimens taken under board (damp) in dry stream bed a considerable distance from water. # 101 & 102. These with no sign of gill stubs or dorsal stripes. Must have metamorphosed some time ago. Air 15.6°, water 22.6° centigrade at 1115 hours.

23 Sept. Calif.: Contra Costa Co., Lafayette Reservoir No animals along face of dam and since no debris at ~~edges~~ ends of dam no newly metamorphosed there as last year. In study area in cove young newly metamorphosed ones common under planks on very wet soil and also under matted dead cattail stalks in mud. Gill stubs present and also in most spotting on tail and dorsal stripes present. No larvae seen in water anywhere. One group of larvae when exposed responded as follows. Most headed immediately toward water (down) and on reaching water rapidly swam away seeking repeatedly to burrow into

Triturus torosus

W. Riemer
1950

23 Sept. Calif.: Contra Costa Co., Lafayette Reservoir
mud of bottom. Others sought other
shelter in immediate vicinity
usually sticking to shaded avenues
of retreat. Few attempted to move
up hill, none onto drier soil
at few inches above original point.
Air 23.8° and water 24.8° centigrade
at 1215 hours. Young Thamnophis
elegans atratus (orange stripe)
taken in area. Later disgorged two
newly metamorphosed Triturus

23 Oct. Calif.: Contra Costa Co., Pinehurst
During salamander census of road between
Pinehurst and Canyon (village) on evening
of first heavy fall rain captured and
retained five adults # 897-901 for
purpose of examining stomach and develop-
ment of gonads. Preserved 26 Oct. 1950 after
having been kept in icebox since capture.

20 Dec. Calif.: Lake Co. While returning from
Clear Lake, picked up a single adult
crossing the roadway at dusk. Exact
locality on map not known. Site of capture
in front of Hennessy's Restaurant, an isolated
roadhouse, about midway between Middletown
and Calistoga. In small open valley
among low hills. Oak association.

W. Riemer
1951

Triturus torosus

6 Jan. Calif.: Contra Costa Co. Visited only Lafayette Triturus study area. 1530 hrs until dark. A single very thin (and weak?) aquatic ♂ at edge of water on dam face. No breeding pigment on soles or thighs, cloaca not swollen, pale gray-brown above, dorsal skin not highly succulent, tail fin developed. No others seen in vicinity but because of direction of light visibility through water poor. At "lake level" guage four or five adult ♂♂ in water but none displaying and none very light colored dorsally. One ♀ on wet soil at foot of grassy slope. Cloaca not swollen, no dark-tipped tubercles, slight tail fin (mid-segment of tail fin missing dorsally), dorsum dark and granular. In quiet pool above lake apparently a large number of individuals (5 in 20 ft. of bank). One ♀ being displayed with second ♂ in attendance.

17 Mar. At Lafayette Reservoir about 0845 collected 35 adults of this species. All but one thought to be ♂♂. Congregated in large numbers along slope of concrete dam face. Appeared especially abundant in 4" - 2 ft. of water though difficult to see deeper. Most of ♂♂

W. Reiner
1951

Triturus torosus

17 Mar. Calif.: Contra Costa Co. seem to be passing into a post-breeding condition in which skin again roughening, breeding pigment disappearing, tail fins becoming reduced. The one ♀ appears fat with eggs. Are rest of females busy laying or have they left the water? A few ♂♂ still appear active as based on presence of breeding pigment. One case of amplexus. Most observed to be resting on substrate with tip of chin close against ground while hind limbs straightened and rest well off ground. Few seen feeding. Are they now fattening up before leaving water? Water temp. 0845 hrs. 14° C. Returning at 1220 water temp. 16° C on dam face and Triturus still abundant. Watched a group of six for a little over 15 minutes during which time not a single one came to surface to breathe. How long can they remain submerged? Do they absorb O_2 from the water and only come to the surface to expell CO_2? Along west side of reservoir examined water and boards very carefully for Triturus. None under boards — most now becoming too dry beneath — none seen in water except by dam. Could this be because of the large number of Rana aurora and

W. Reiner
1951

Triturus torosus

17 Mar. Calif.: Contra Costa Co. Rana catesbiana present? In small side pool several Triturus present. One regressing from breeding condition as those on dam. Water temp. 12.5°C at 0900 hrs. Also took several Triturus from concrete valve pit below dam.

31 Mar. At Lafayette on dam face Triturus are still very abundant but tend to be in deeper (4-5 ft.) water. Water extremely clear, one being able to see to 6 or 7 feet deep. One ♂ captured as sample. Had strong tail fin, no breeding pigment, dorsum still smooth, cloaca slightly swollen, tubercles numerous and even distributed over ventral surface of trunk. Many in of lower jaw also well studded with dark-tipped tubercles. Only one pair in amplexus and ♀ with only few, almost ripe eggs. ♂ lacked breeding pigment. Where banks relatively steep, or at least in the cove NW of dam adults far out in very deep (probably 20-30 feet) water. All superficially appeared to be ♂♂. Noted that the animals float freely in the water, fish-like whereas in shallower water they tend to remain rather strictly on the bottom. Near depth gauge egg masses attached to cattail stalks in about 4 ft. of water. Several empty (except for a single animal) but jelly

W. Reiner
1951

Triturus torosus

3| Mar. Calif.: Contra Costa Co. still firm indicating young hatched within last few days. At least one mass with none yet hatched but young appeared ready to hatch. Small larvae common on muddy bottom in about 12 inches of water. Are they frequenting shallow water because food is more abund and there, because it is warmer there, because they are avoiding contact with adults?
At Pinehurst 8 adults captured. 4 recaptures and 4 new, # 7, 38, 99, 125, 137-140. Eggs being laid last week appear undifferentiated through probably in blastula stage. At least 12 clusters known in area. Two ♀♀ laying when captured and one apparently just ready to lay. Weather, clear, sunny, cool. Stream exceptionally clear. Violas blooming and poison oak just coming into leaf.

7 Apr. At Lafayette Triturus still abundant in the water on dam face. Tended to be only in deeper water 5-6 ft; choppy on surface and difficult to see. In a protected spot at the corner of the dam many animals in shallow water. One pair in amplexus. ♂ without breeding pigment at all though cloaca swollen and actually clasping ♀'s back. ♀ plump.

W. Remier
1951

Triturus torosus

7 Apr. Calif.: Contra Costa Co. Weather: cold, slightly foggy, heavy overcast. No check on larvae because of rough water and poor light.
At Pinehurst handled 3 ~~sep~~ recaptures and two new animals. Eggs being laid on 24 Mar. still appear undifferentiated. Other clusters laid at unknown times in late tail bud and neural plate stages. No temp. taken today. Stream clear, flow receding, easy to see into even deepest parts.

14 Apr. Captured on dam face at Lafayette 43 animals in less than 20 minutes. Situation as regards abundance and location of animals essentially as last week. Water rough and somewhat murky making visibility poor. At 1000 hrs. temp air 10½° C, water 16½° C.

Pinehurst, 1230 hrs.; temp of air 10° C, water 10½° C. 6 animals handled, all ♂♂, only one new. (See 9, 17, 47, 97, 130, 143).
Eggs: in pool below area single cluster in tail bud stage found. 104.0-5.8 the single cluster of known laying date in early tail bud stage. Adjacent group of clusters in later tail bud stages. 104.1-5.7 the single cluster found last week in straight elongate limb bud stage.

W. Reiner
1951

Triturus torosus

14 Apr. Calif.: Contra Costa Co. 103.3 -5.6 the single cluster at tail bud stage. This also of known(?) laying date. Clusters above area in tail bud stage. Violas with last blooms. Small collection of plants taken.

21 Apr. Lafayette. Animals still abundant on face of dam but seemingly less so than in prior weeks. Water rough but relatively clear. Animals (♂♂ ?) generally with slight tail fin, granular dorsum, dark-tipped tubercles below, cloaca only slightly swollen. One individual with slight breeding pigment left plus other breeding season characters. Animals still swimming in deep water near depth guage. Appear to be closer to breeding condition than those on dam but none captured for examination. Larvae present in quiet water in cove NW of dam. Hind limb buds just differentiating into toes (limb about ½ mm. long.) Side pool now dry and remains of insects and tadpoles abundant on the bottom.
Pinehurst. 104.1-5.7, single cluster with anterior limb buds obvious but no pigment as yet. Thrash about when disturbed. 104.0-5.8, single cluster of

W. Reiner
1951

Triturus torosus

21 Apr. Calif.: Contra Costa Co. Known laying date with larvae in crescent moon shape. Head evident. Group of clusters in same location at developmental stage midway between these two clumps. 103.3 - 5.6 at same stage as cluster of known laying date above. Only one adult found # 144 and newly marked. At least one other ♂ seen in water.

28 Apr. At Lafayette animals still present on dam face but becoming uncommon, 18 counted in 200 ft. of dam face (strip about 6-8 ft. wide). A few animals in deep water by depth guage. In same condition as those on dam, i.e. very similar to terrestrial condition, except those in deep water with more of a tail fin. Larvae taken in quiet water of cove were of following lengths: 29, 28, 28, 27, 25, 23, 21, 20, 20, 19, 19, 18 mm (total length). Average = 23.1 mm. At Pinehurst, because of heavy rains during preceding night, the stream swollen and very muddy. Most of it not examined. Single juvenile marked # 145.

5 May More rain during past week. Expected Triturus to take advantage of wet soil and leave water. Instead, at Lafayette found that animals more abundant on the dam face, 42 in 200 ft. Water very clear and

W. Reimer
1951

Triturus torosus

5 May Calif.: Contra Costa Co. since most animals now in deeper water 4-5 ft. possibly they could not be seen last week. Consider number present as abundant. Animals with dark-tipped tubercles on the venter, cloaca only slightly enlarged, tail slightly finned. In deep water by the depth guage two individuals seen. Both floating free in water with legs extended. Tail primary organ of locomotion though legs (both fore and hind) used also. Appeared to feed occasionally while floating free by making a quick dart forward of perhaps an inch. Accomplished by a quick flick of the tail. In deep water do they tend to float normally? In shallow water animals always resting on bottom. Because of losses in sample of larvae taken last week a new sample of 14 taken today. ∧ [23.4 mm
Lengths: 28, 28, 26, 26, 25, 23, 23, 23, 22, 23, 21, 21, 21, 19 mm. Average
At Pinehurst stream slightly murky. No Triturus seen. Eggs at 104.1-5.7 with evident eyes and dorsal stripes. At 104.0-5.8 cluster of known date with neither eyes nor pigment in stripes. In mass of clusters at same locality dorsum gray but no pigment stripes. 103.3-5.6 eggs developed as the known date ones at 104.0-5.8.

W. Riemer
1951

Triturus torosus

19 May — Calif.: Contra Costa Co. At Lafayette counted 11 adults along 200 ft. of dam face. Mostly they stayed down in deeper water almost out of sight. Water very clear. At depth guage one adult captured. Had prominent tail fin and strong labial folds. Folds only present in aquatic phases; an adaptation for feeding in water. Tail more strongly finned than those on dam. Larvae abundant by depth guage. Have not been seen there since hatching time. Sample of larvae taken in cove. Following are total lengths: 39, 34½, 33, 30½, 30, 29½, 27, 27, 26, 26, 25, 25, 23, 19½ mm. Aver. 28.2 mm. At Pinehurst saw no Triturus. All larvae with prominent eyes and dorsolateral stripes. Group 104.1-5.7 may be in part hatched. Hatching appears eminent.

26 May — At Pinehurst no Triturus seen. Eggs at 104.1-5.7 hatched completely whereas none of other clusters hatched yet. All probably will hatch within a few days. Stream mostly slow, clear, getting low. Weather suddenly very warm for past few days.

W. Reiner
1951

Triturus torosus

9 June Calif.: Contra Costa Co. At Lafayette only 2 animals counted on 200 feet of dam face. Only 4-5 seen totally. Water very clear and not rough so visibility good to six feet or more. Two animals examined: tubercles on venter faint and light brown in color; none on lower jaw; cloaca slightly enlarged only; tail with slight dorsal fin; labial fold present. Nothing seen by depth guage. Larvae abundant in cove and 14 taken with following total lengths: 42, 40½, 40, 39, 36½, 35, 34, 34, 34, 30½, 29, 28, 25½, 25, mm., aver. 33.8 mm. No larvae seen near cattails and none seen in sunny water. Grass now quite dry.

At Pinehurst eggs at 104.0-5.8 laid on 24 Mar. about ½ hatched. Adjacent groups & clusters mostly hatched. Single cluster at 103.3-5.6 ready to but not yet hatched. No Triturus seen. Apparently under conditions prevailing at Pinehurst 11-12 weeks required for egg hatching.

4 Aug. This is first visit to study areas in several weeks. At Lafayette no adults anywhere. Large larvae present on dam face at least at NW end and in cove NW of dam. 10 animals collected here. Total lengths: 58, 58, 47, 46,

W. Riemer
1951

Triturus torosus

4 Aug. Calif.: Contra Costa Co.

45, 45, 42, 40, 36, 36 mm. Aver. length. Most found entangled in submerged weedy growth in shallow water. No metamorphosed animals found. At Pinehurst larvae present in small pockets where they were abundant. Most 20-30 mm. total length. Appear to select quiet, mud bottom areas and remain not far from edge of water. Stream cold but still flowing unlike last year. Soil under boards in shade still moist. Disporum with ripe fruits.

17 Aug. First larvae of season metamorphosed and under boards on saturated soil ~~and~~ at edge of lake at Lafayette Dam. Only about 6 seen and larvae still present in lake. Larvae seen only in cove, none on dam face, none by depth guage. Water at dam at 1530 hrs 27½° C. Air 32° C

21 Aug. Calif.: Alameda Co., Oakland, 1¾ mi. NW Lake Chabot Dam

Visited small muddy pond at upper end of 106th Ave. Pond about 50 x 15 feet, visibility below surface about 1 inch because of mud, temperature at 1800 hrs. 24½° C. Surrounding ground barren and trampled by stock. Triturus in small numbers in post-larval state under boards.

W. Riemer
1951

Triturus torosus

21 Aug. Calif.: Alameda Co., Oakland, 1¾ mi. NW Lake Chabot Dam
Animals had obviously just metamorphsed since many of those taken still had larval rather than adult pigments. This retention of larval pigments after gills lost is in sharp contrast with large gills present on *ninularis* even after adult pigments well developed.

12 Sept. Calif.: Santa Cruz Co., Waddell Creek, 150± ft., 2-5 mi. from ocean beach
Came across a poorly preserved larval specimen of Tom Rodgers (# 1416) from above locality, and collected 8 Aug. 1938. About 30 mm total length. Indistinct but difinite dorso-lateral stripes present.

15 Sept. Calif.: Contra Costa Co., Lafayette Reservoir Large numbers of newly metamorphosed young under boards near waterline in cove NW of Dam. Larvae in this area scarce, one taken in 6-8 sweeps through water weeds. On dam face under floating water weeds were 3 post-larval and 4-5 larval animals. 2 of later captured. Total lengths: 54, 47, 45½ mm. Aver. 48.8 mm

15 Sept Calif.: Contra Costa Co., Pinehurst Stream still flowing whereas in previous years all water gone about mid-August. Larvae present in several places in study area and abundant in deep (about 2 feet) pool out of current where stream turns 90° to right.

W. Reiner
1957

Triturus torosus

15 Sept. Calif.: Contra Costa Co, Pinehurst Here found exposed or partially hidden in fine alga growing on bottom. Other places generally hidden among rocks on bottom or in dead leaves on bottom. Fish abundant in stream but not present where Triturus common. Also no Triturus where fish common. Larval animals are still very small! How can they metamorphose before fall rains flush stream course? Total lengths: 36, 28, 26, 33, 30, 30 mm. Average 30½ mm.

14 Oct. larvae still small (unmeasured) and still present in same spots in stream. In certain places stream is no longer flowing but in general a trickle remains. Recent rains appear to have either not reached Pinehurst or at least not have affected the stream level.

10 Nov. Calif.: Contra Costa Co. Considerable rain followed last visit to study areas. Appears to have little effect. Lafayette — still a small number of recently metamorphosed animals under boards at waters edge. Saw ~~none~~ no larvae in water. Adults not seen except three emaciated ones in bottom of valve pit — apparently trapped. Some fresh new green growth, soil slightly damp. At Pinehurst stream

W. Reiner
1951

Triturus torosus

10 Nov. Calif.: Contra Costa Co. Level slightly higher than before but larvae still present in same pools as before. One large one measured as 37 mm long.

8 Dec. Heavy deluges have occurred since last visit to study areas. Weather decidedly cooler also. At Lafayette Reservoir water level up and isolated pool at NE corner of lake full. No sign of animals in the water. No young post-larval animals under boards by lake. Since soil thoroughly wet they have dispersed. Three adult males and three post larval young however taken under boards in vicinity. Young of following lengths: body, 27 mm., total, 52 mm. gill scar present
30 " " 56 " " " "
33 " " 66 " " " "
Adult ♂♂ with a slight tail fin dorsally (2) and the other with a well developed dorsal fin. Cloaca from slightly to moderately swollen. Dorsum granular in all though not to extent ♀♀ often exhibit. Individual with tail fin also pale colored and with dark-tipped tubercles on venter and about lower jaw. Do these sex characters develop in ♂ before he enters water for breeding? Why are there no females about? No Triturus seen at Pinehurst. Stream completely flushed

W. Reiner
1951

Triturus torosus

8 Dec. Calif.: Contra Costa Co. during past storm so that at least 4-5 feet of water scoured channel. There is no possibility of the larvae not yet metamorphosed (and I think none did metamorphose) could have survived. All of them if not rather immediately killed by the ~~tub~~ turbulence of the water were washed into the reservoir several miles downstream.

29 Dec. Extremely heavy rains have fallen during much of past week. Went to Lafayette study area to see if animals abroad at dusk yet. Two subadult ♀♀ walking about near edge of temporary deep pool by NW cove. Both tossed into water, sank, did not reappear. Why? Two ♂♂ taken under board. Both with upper tail fin, smooth skin, broadened hind legs, somewhat swollen cloaca. Could find none in water. Apparently still too cold or too "early" in the season for animals to be active.

W. Reiner
1952

Taricha torosa

19 Jan. Calif.: Contra Costa Co., Lafayette Reservoir

Extremely heavy rainfall and cold weather since beginning of month. Check of this study area made to determine if species yet active and moving to or in water. Water level highest in several year at least. Almost completely covers dam apron. At depth guage covers distal end of boardwalk. Water murky so that visiblity poor. Found no animals in water of lake or temporary pool. Temp. of lake 8½°C, of pool 8°C, of air 6 in. above pool surface 8°C, of soil (just below surface) near pool 5°C. Two Taricha found under boards. One emaciated adult ♂(?) and one half grown, plump ♀(?). Soil under animals both 6°C. Both lethargic. Adult on being picked up immediately formed 6-shaped figure in defense pose. Under board near olive pit adult ♂ on being picked up also assumed this pose. Is cold weather conducive to use of this pose when animal too cold to attempt escape? Same ♂ with dark but smooth skin, partially swollen cloaca, breeding pigment on soles and thighs, tail fin. I doubt if this animal has yet been in water this season. Apparently weather is too cold yet for the species to be active in this area.

W. Reimer
1952

Triturus torosus

2 Feb. Calif.: Contra Costa Co. At Lafayette Reservoir lake is still high and murky. No Triturus on dam face. Water temp. here 93/4°C and air 10¼°C. Single young individual floating exhaustedly in water. In quiet water where lake over flowed into shallow willowy area a since ~~mating~~ breeding ♂ seen. None in temporary pool above NW cove. None seen in shallow puddles above W side of lake except in puddle in road. Here several ♂♂ in full breeding condition, one amplexing ♀. Water temp. 9½°C. No algae and grass on bottom of this puddle (about 10 x 50 feet by 6" deep) whereas much vegetation in other adjacent pools. Could it be that Triturus now breeding in protected or deeper levels in lake — out of sight?

13 Feb. Calif.: San Mateo Co., ~~¼ mi. N, ¼ mi. W Searsville Lake Dam~~ 2 mi. S Woodside
Subadult walking across foot trail 6 feet from cascading stream. Semi-open young redwood forest. Weather at 1230 hrs sunny, bright, clear. Sun confined to opposite side of ravine.

13 Feb. Calif.: San Mateo Co., ¼ mi. N, ¼ mi. W Searsville Lake Dam
In 20 minute search single ♀ found. In quiet arm of small stream through shallow ravine in rolling oak-grassland. Stream slightly murky with deep (at least 4 feet) pools

W. Reiner
1952

Triturus torosus

13 Feb. Calif.: San Mateo Co., ¼ mi. N, ¼ mi. W Searsville Lake Dam.
and moderate to rapid water flow. Several small rock check dams with pools. No stream vegetation. ♀ loaded with eggs. Probably good stream later in season.

23 Feb. Calif.: Contra Costa Co.
Water on face of dam at Lafayette murky so that difficult to see if animals present in water or not. Did see one ♂ on dam face and one beyond edge of dam in shallow water. One also in temporary pool at end of cove. One in foot deep small narrow pool on west side of lake. Other such pools, all temporary, with much algae which would make swimming difficult and no Triturus present. Similar pool in dirt roadway now without Triturus — there were some in this pool on last visit. None seen were ♀♀. In valve pit several dozen of both sexes taken. Amplexus occurring and spawning also. Does this mean animals are present in lake but simply down ~~depth~~ deep and hence not visible? Water on dam face absolutely still. In quiet shallow water at edge of lake a carcass of Triturus found on bottom. Head, guts and cloaca and forelimbs missing. Two remaining pieces represented untouched tail, hind limbs

W. Reiner
1952

Triturus torosus

23 Feb. Calif.: Contra Costa Co.

and vertebral portion of trunk together with small portion of belly wall. Willows in vicinity and I first thought that hawk could have discarded carcass from perch above. Two other carcasses in pool in dirt roadway mentioned above. One of complete animal except viscera lacking. The other a girdle with limbs attached. Pool clean mud bottomed, no cover, no trees or shrubs in immediate vicinity. This suggests a water bird (perhaps goose, though none present) or a mammal (raccoon?). Predator must have entered water to catch prey and apparently remained in water during meal. This may be main source of adult deaths next to automobiles. 1045 hrs., H_2O 10½°C air 13°C on dam face.

At Pinehurst stream still rapid and opaquely murky. Signs that at height of flooding water 5-5½ feet deep where now is only 2-3 inches. No larva could withstand such a flushing, or adults either. Single juvenile found and marked though search not intense.

4 Mar. Calif.: Contra Costa Co., El Sobrante

Roger Brand of 982 St. Andrews Dr. showed me a tiny pool in a near dry

W. Reiner
1952

Triturus torosus

4 Mar. Calif.: Contra Costa Co., El Sobrante

stream bed from which he claims he captured about 68 adult T. torosus during several days of previous week. On this date at dark, 1815 hrs., two more adults from this pool now only 3 feet square and perhaps 18 inches deep. Muddy. Several more taken in stream a few hundred feet down stream. Water not deep enough to completely cover adults backs. Egg clusters from pool almost entirely hatched. Site is shallow ravine in rolling cultivated (grain (?)) hills. Only tree in sight in any direction was one large willow a few feet from pool. No shrubs. Where do all these animals come from in this cultivated area. Water is not permanent. How do larvae ever develop?

8 Mar. Calif.: Contra Costa Co.

At Pinehurst stream muddy from rains during past two or three days. Stream received thorough flushing and water depth about 3 feet in shallow areas. Seasonal height of about 6 feet. No Triturus in stream or under boards. At Lafayette 17 counted in four sections of dam face. All deep in water none in amplexus. Lake water extremely clear and calm.

W. Reiner
1952

Triturus torosus

8 Mar. Calif: Contra Costa Co.

Water temp. at dam at 1445 hrs 13° C.
Two adult ♀♀ taken in temporary pools NW of lake. Many Hyla eggs present. Several adults taken in valve pit on dam face. Many eggs laid here. One ♀ in laying process. All ♀♀. Rest of ♀♀ entirely or nearly spent. Apparently all ♂♂ in lake and not wandering around.

29 Mar. At Pinehurst stream still flowing swiftly but not flooded and essentially clear except in depths of 6-8 inches or more. H_2O temp. at 1745 hrs. 12°C. Eight adults captured in stream, marked or remarked and released. Two of these ♀♀ and being amplexed. ♂♂ in full breeding condition. ♀♀ appear ready to lay eggs. 5 specimens handled included # 07, 09 originally taken in 1949; # 125, 134 recaptures from last year; # 147-150 newly marked. Weather, cool, clear, sunny.

5 Apr. Calif.: Alameda Co, 1¾ mi. W, 2 mi. N Cedar Mt., Arroyo Mocho, 1500 ft.

2 newly metamorphosed young, somewhat emaciated under log on damp soil 8 feet from edge of large pond. 1640 hrs. Cool, overcast. Scattered oaks in grassland. Rolling hills. 2 more in same type of situation. One 30 feet from pond. All soil damp with their cover of annuals 3-4 inches high. Batrachoseps abundant.

W. Reiner
1952

Triturus torosus

5 Apr. Calif.: Alameda Co., 1 3/4 mi. W, 2 mi. N Cedar Mt., Arroyo Mocho 1500 ft. A

Several more young from mouths of ground squirrel (?) burrows 3-6 ft. from edge of pool. There are two large pools here, one apparently deeper than the other. ~~Of~~ Grass and algae of deeper pool, when swept with net in shallow water (8-10 inches) revealed large numbers of newly hatched Triturus larvae. Hyla tadpoles also abundant. In shallower pool 5 adults taken. These were hidden in thick algae submerged in water. Larvae could be swept from this pond also but in smaller numbers. A small dead plant pulled from bottom of pond was covered with 80 egg clusters. Plant less than size of two of these pages. Most of larvae hatched but many still developing but immediately ready to hatch. Present then in pools are 3 generations at least. Newly hatched, newly metamorphosed, adults. Temp. of water at 1730 hrs. 24° C.

Eye pigment patterns of 7 post-larval young:

D D D D E D E

6 Apr. See following 12 Apr.

W. Riemer
1952

Triturus torosus

25 ft.

12 Apr. Calif.: Santa Cruz Co., Waddell Creek, 3¼ mi. E Ano Nuevo Point,
20 adults, only one ♀ which is a ♀ collected in water or on immediately adjacent bank of large quiet area of stream and small blind arm of stream. Stream 8-20 feet wide with rapids in narrower portion, deep (3-4 feet) quiet water in ~~shallows~~ wider portion with a gradual slope to one shore. Blind arm about 6 X 15 feet by 1 foot deep. Water clear, temp at 1015 hrs 11° C. Air 12° C. Bottom of rock, sand, silt. One bank gentle and sandy the other precipitous fragmented rock cliff heavily festooned with ferns and mosses. Almost all of ♂♂ with fully developed breeding pigments, a few apparently entering or past this stage. Almost all submerged sticks heavily hung with egg clusters, especially in blind arm where most of animals congregated. Weather overcast. Occasional sprinkles. Further up stream several pairs in amplexus. Eggs examined in late neurula, 2 & 4 cell stages. One ♀ taken crossing dirt road at noon. Still overcast. Ruvifel collected several under logs and rocks. See granulosus account for this locality also. About one gallon of egg clusters collected from same area where the 20 adults taken. On 14 April, after spending weekend at 13° C in bone room,

W. Reimer
1952

Taricha torosa

25 ft.

12 Apr. Calif.: Santa Cruz Co., Waddell Creek, 3¼ mi. E Ano Nuevo Point

egg clusters examined for stage of development. Most in early and late tail bud stages though a few still in neurula stages. One root ⅛" in dia. X ~~#~~ 16" in length with 23 clusters. Another ¼" X 17" with 22 clusters. Of 5 clusters examined the number of embryos was 13, 18, 18, 19, 21. Average: 18.
Also examined shallow concrete lined pool on slope above house. A few adult torosa present but large numbers of small larvae also present, probably a week or more old.

6 Apr. Calif.: Mendocino Co., 2¾ mi. E, 2¾ mi. N Hopland

Three adults taken under boards on hillside by Mervine Larson. Slope presumably above Hopland Experimental Range of Univ. Calif. Says they were common.

21 Apr. Calif.: Contra Costa Co., Pinehurst

Eggs apparently all laid by now. Clusters examined with embryos of early to late tail bud stages. Found only 2 animals, a post-breeding ♂ #74 (?) and a newly marked juvenile #151 the latter not in water. 0945 hrs. air temp. 14½ °C, water 10 °C. Soil generally damp yet so that adults leaving water would have no difficulty in moving on surface.

W. Riemer
1952

Triturus torosus

17 Apr. M.V.Z.

At 1700 hrs 8 March 1952, 17 eggs fertilized by sperm, both parents coming from Lafayette Reservoir, Contra Costa Co. 1700 hrs 14 March only 11 eggs show development. 1215 hrs 9 Apr. 10 eggs remain alive, 1 having died in late tail bud stage. 16 Apr. 2 hatched prior to 0800. 17 Apr. 3 hatched prior to 1100 hrs. 4 fail to hatch (dead) by 22 Apr.

26 Apr. Calif.: Contra Costa Co.

Lafayette study area — in valve pit larvae now in process of hatching. No adults present. One larva somewhat larger than hatching size seen in cove. 5 adults present on 4 sections of dam face. No egg clusters found. Pool beyond cove muddy, water still high and large numbers of R. aurora (small individuals) present. Saw no Triturus. Water temp. on dam face 0940 hrs. 16° C, air 14½° C Water clear, quiet. Temporary pools W & lake dry now. Wild oats appear full grown. 22 juveniles to subadults released, after several months in captivity, on dam face apron (level concrete surface) about 6 feet from water and 3 feet above water. Animals scattered in all directions showing no tendency to go toward or away from water. Those later tossed into water

W. Reiner
1952

Triturus torosus

26 Apr. Calif.: Contra Costa Co.

immediately sought to get out. Did not go to bottom as aquatic adults do but remained at surface while swimming toward shore. Did all return to shore?
Pinehurst — no adults. Larvae in pre-stripe condition. Water clear. Weather cool, clear, overcast. 1040 hrs. H_2O 11° C, air 14° C.

3 May Calif.: Santa Cruz Co., 1 3/4 mi. E, 1½ mi. N Boulder Creek (town), Bear Creek, 650 ft. Single post-breeding (?) individual taken in quiet, shallow water of stream. Only small portion of stream examined. Fisherman said had seen more earlier in day and this said in late afternoon. Rana boylii eggs abundant in adjacent quiet water attached to rocks. Stream 20 feet wide, many areas of quiet water.

28 June Calif.: Contra Costa Co., Canyon (town)

Dr making road check in canyon C. Lowe picked up several Triturus crossing road during rain. All young or subadults except this one given to me, # 1340. Heavy unseasonal rain 27 June (night), 28 June (all day). Stebbins checking road 28 June at night picked up large number of specimens on road.

W. Riemer
1952

Triturus torosus

2 Aug. Calif.: Contra Costa Co., Pinehurst

Sample of 10 larvae collected from study area. Stream still flowing but largely made up of quiet areas interconnected by small areas of moderate flow. Extensive construction work on road at head of area put much silt in water. This has apparently not affected the salamanders or fish. Weather cool, clear, sunny. Air 21¼°C, water 15¾°C at 1210 hrs. Larvae mostly from under leaves and rocks resting on substrate in shallow (2–3 inches) water with no flow.

2 Aug. Calif.: Contra Costa Co., Lafayette Reservoir

Water level down 10 feet approximately below normal summer level. No larvae could be found nor could any metamorphosed young be found. Rana aurora larvae with hind legs and of large size common. Weather hot and sunny at 1300 hrs.

30 Aug. Lake level about 12–14 feet below normal. Water at 0800 hrs. almost mirror quiet and very clear. Adults present to number of 11 in westernmost 4 sections of dam face. Most at considerable depth. ~~Four~~ Three captured. No larvae on dam face or in submerged masses of vegetation at east end of dam. Weather; cool, clear, sunny. Temperature H_2O 22°C, air 17°C 0830 hrs. Water now disturbed and difficult to see to any depth. No larvae or adults seen

W. Reiner
1952

Triturus torosus

30 Aug. Calif.: Contra Costa Co., Lafayette Reservoir
in other portions of lake shore examined.
On return to dam at 0915 water again
mirror calm. 20 animals counted in
five dam sections. 3 of these larvae or
postlarval young. All but 8 adults on
dam section closest to west end of dam.
Very few animals encountered toward
center of dam. Young all within few
feet of end of dam where weedy cover
available. Several more adults and
one large postlarval young collected.

30 Aug. Calif.: Contra Costa Co., Pinehurst
Stream small but still flowing. All but
shallowest areas are mirror smooth pools.
10 larvae taken from beneath leaves and rocks
in shallow quiet water at edges of pools.
They do not appear appreciably larger than
those taken one month ago. One Hyla
taken in area also. Soil near stream
level but even some distance (to 20 feet)
from stream very moist. 1115 hrs. air
17° C, water 12.5° C. Weather, clear,
cool, sunny.

15 Oct. Calif.: Contra Costa Co., Vaca Canyon, 3 mi. S, 1½ mi W Martinez
Collect large series of larvae and metamorphosing
animals in small stream adjacent to road.
Steep-sided ravine, water shallow, one or

N. Riemer
1952

Triturus torosus

15 Oct. Calif.: Contra Costa Co., Vaca Canyon, 3 mi. S, 1½ mi. W Martinez

two inches deep in moving parts and 2½ ft. deep in pool examined. Width about 5 ft. Water scummy on surface, with green algae ~~over~~ covering portions of soft, deep muddy bottom. Majority of larvae in pool formed by slide. Pool 90 ft x 5 ft. Larvae mostly resting on bottom mud and hidden in bottom algae and mud. Best collecting by skimming bottom with kitchen strainer. Postlarval young abundant in moist soil at edges of pool. Surrounding vegetation of buckeye, bay and oak and open grassland. Typical north slope chaparral on adjacent hills. Temp. 16 45 hrs.: air 14.5° C, H_2O 13.5° C.

8 Nov. Calif.: Contra Costa Co. Lafayette Reservoir

At Lafayette Reservoir found no adults on dam face; water somewhat murky and somewhat rough but considerable length of dam inspected. Lake level high as in spring with water covering highest of dam apron horizontal strips. Took 3 post-larval young at west edge of dam under cattail debris on wet soil. Swarms of argentine (small black) ants present also. Situation shaded by tree. All soil on surrounding slopes dry — there has been no rain yet this season

W. Riemer
1952
1953

Triturus torosus

8 Nov. Calif.: Contra Costa Co.

I do not know significance of their presence but about a dozen empty 100 lb sacks of "bluestone" stacked on dam face as if this chemical had been spread in lake. What effect this might have I do not know. Water temperature 1115 hrs, 17.5°C

At Pinehurst saw a few larvae but did not collect any. Not common as in previous visits. Stream level about twice as high as last month although no rain has fallen — soil dust dry. Continuous moderate without division of stream into pool areas as before. Where has additional water come from? Temp. of water 1155 hrs. 11° C.

13 Dec. Several Triturus under boards at Lafayette. None in lake. Grass sparse and only a few inches high. At Pinehurst much evidence of recent flooding though stream level at spring normal, clear. H_2O temp at 1200 hrs. 9.5°C.

24 Jan. One and three quarter hours spent at Lafayette Reservoir with purpose of collecting sample of this species to determine breeding development. Period spent so doing 1400-1545 hrs. Single ♀ taken in water; this one clinging to

W. Riemer
1953

Triturus torosus

24 Jan. Calif.: Contra Costa Co. Lafayette Reservoir
cattail stalk in deep (6 ft.) water close to shore. Cloaca slightly spread on capture suggesting she was in process of laying. One complete egg mass noted at this spot. Males very common here. Air temp. here (by depth guage) 14°C, H_2O 11½°C at 1430 hrs. ♂♂ wary. Water level as high as I've ever seen it, almost to horizontal apron of dam at edges of dam. Count of animals on dam apron gave 5 animals for 4 sections of apron. None in center of dam. Abundant on lateral most section. In temporary pools near lake captured 8 ♂♂ all in breeding condition. Temperature of such pools 10°, 14°, 15°, greatest number in pool of 14°. One emaciated ♂ several ♀♀ and juveniles taken from under boards. Grass now well up 3-4 in. Appears that breeding season just beginning with all adult ♂♂ in water, ♀♀ just beginning to enter but mostly still remain on land.

29 Jan Calif.: Contra Costa Co., Tilden Regional Park, Jewel Lake On suggestion of S.F. Cook, Jr. I examined small shallow pool on the exposed face of Jewel Lake dam between lake and the pool below spillway. 0920 hrs. air temp.

W. Riemer
1953

Triturus torosus

29 Jan. Calif.: Contra Costa Co., Tilden Regional Park, Jewel Lake

7°C, water in pool 6°C. No animals in pool. One breeding ♂ on land at edge of pool. Immediately below pool at very edge of spillway where it empties into pool a pile of debris — sticks, cattail stalks, leaves, etc. - had accumulated. Debris in splash zone of water spilling off end of spillway. At base of 10-12 foot bank, at edge of spillway pool. In debris, especially at base of pile large numbers of Triturus hidding. About 24 adults taken in area 1 x 3 ft in 10 minutes or less, as fast as debris could be moved and animals put in jar. Most are breeding ♂♂, a few ♀♀. Some, a minority appear to be T. granulosus. Weather: cool, sunny, clear. Several of ♀♀ with oviducts filled with eggs, one with eggs in cloaca. Are animals laying now?

1 Feb. Calif.: Napa Co., Eticura Creek, 9½ mi. NNW Monticello

S.F. Cook, Jr. captured two of this species under rocks near stream (a small tributary stream). One a gravid ♀, one of last summers young. Saw more in stream. Apparently breeding season just beginning to get underway or population sparse. Also see journal for this date.

W. Riemer
1953

Triturus torosus

1 Feb. Calif.: Yolo Co., Putah Creek, 1½ mi E Yolo, Napa, Solano Co. lines junction. 2 adults, 1 aquatic ♂, one terrestrial, gravid ♀ taken. Oak woodland on steep grassy hills, grass short yet. Stream where taken small 4-6 feet wide and with few quiet pools. Season for breeding just beginning? Many similar but quiet streams crossing road through Pleasants Valley and Vaca Valley in NW Solano Co.

7 Feb. Calif.: Contra Costa Co., Pinehurst 2 new animals marked in study area for Triturus. Apparently ♂♂ only beginning to enter water and ♀♀ not yet present. Stream slightly murky and at spring normal. Grasses just beginning to appear. Soil damp but not wet under surface litter. Batrachoseps abundant. 1515 hours air 11½°C, water 11°C. Weather grey, heavy overcast.

21 Feb. Calif.: Contra Costa Co. Stream at Pinehurst with moderate flow and level about that normal for April. Water clear. 0930 hrs. air 5°C, water 5½°C. Not Triturus found. Is this water too cold for animals to be active? In small stream near Moraga, with no visible flow found one pair in amplexus. Ideal looking spot with practically no obstruction of entire stream bottom and banks. ~~then~~ Would have expected animals to be abundant. Temperature of water at 1000 hrs. 5°C. Weather bright,

W. Riemer
1953

Triturus torosus

21 Feb. Calif.: Contra Costa Co. clear and cold. At Lafayette 1015 hrs. air, 13° C; water 12° C. Counted 3 animals on four sections of dam apron. One at extreme edge of water o ttwo deep. Water relatively clear, quiet, Several egg clusters found in shallow water — about 1 ft. below surface. All in later larval stages; 31-34-38. Poison oak just beginning ~~to be shed~~. to bud. Monterey pines now shedding pollen. Several ♀♀ taken under boards, all ♂♂ taken in water. Following noted as behavior of ♂♂ in deep water as regards coming to surface to get (or emit) gases. Rise to surface gradual until animal within from one foot to several inches of surface. During this slow rise animal in relaxed attitude with limbs out stretched, the body suspended most leisurely in horizontal position in the water. This seems strange in itself since usually animals rest lightly on bottom with no tendency to float. While so suspended animals frequently make slight foward movements, propulsion being by the tail only, as if animals are feeding. Such movements maybe a few ~~millimeters~~ or a few inches in length, usually rather short. When animal within vicinity of

W. Reiner
1953

Triturus torosus

21 Feb. Calif.: Contra Costa Co. surface — a foot or several inches — they leisurely swim at a moderately steep angle, 45° or more to the surface, breakit and immediately swim rapidly downward, sometimes vertically but always at 45° or more, toward or to the bottom, at least out of sight in the depths where observations made. Sometimes downward flight interrupted by momentary period of free floating at a distance of several feet below the surface. The downward flight seems always resumed in a moment.

23 Feb. Calif.: Santa Clara Co., 4 mi. S, 1½ mi. E Coyote Reservoir Dam. Marshy pool in temporary stream course. Single pool 150 by 30 feet, largely choked with water cress and algae plus various other water weeds. Single adult ♂ seen and taken. Eggs in stages 30–33. Aurora eggs also present but undeveloped. Zweifel picked up juvenile under board near pool margin. Individual appears newly metamorphosed with gill stubs, small mouth, dorsal pigment over entire upper jaw area. Surprizingly large for this stage of development. Temperature 1545 hrs. air 13° C, water 7½° C. Cook reported clear concrete pool short distance upstream free of salamanders. Chaparral-oak woodland

N. Riemer
1953

Triturus torosus

23 Feb. Calif.: Santa Clara Co., Coyote Creek, 3 mi. S, 2½ mi. E Coyote Reservoir Dam. Large stream with rocky bed. Stream clear even in deeper pools with little stream bed vegetation and little litter in pool bottoms. Cut-off portion of stream, as a large isolated pool 100 by 12 feet, yielded 12 adult ♂ Triturus. Bottom with heavy carpet of algae and one bank with numerous projecting and submerged branches and roots. Temp. in pool 1630 hrs. 10° C. Two other individuals, ♂ and ♀ taken under logs on adjacent bank. No Triturus seen in stream. Too clean? Adjacent hills with oak chaparral growth.

1 Mar. Calif.: Alameda Co., Arroyo Mocho, 8 mi. S, 4½ mi. W Midway, 1500 ft. Here in pools visited last 5 April a series of adults collected, a sample of eggs collected — the eggs being in all stages of development from freshly laid to hatching, a group of two post-larval young, and one fully developed larva seen. The eastern-most of the pools, the one supplying all the adults on both occasions was on this date a muddy brown color, the other pool a bright algal green. Temp. at 1145 hrs. muddy pool 10½° C, algal pool 12½° C. air 8° C. Adults were abundant

W. Reiner
1953

Triturus torosus

1 Mar. Calif.: Alameda Co., Arroyo Mocho, 8 mi. S, 4½ mi. W Midway, 1500 ft. in muddy pool, mostly seen lying on bottom. None seen in green pool. None seen coming to surface in either pool. Eggs abundant in both pools being present in great clusters on submerged grass like growths. Along shores many entirely exposed by receding water. In green pool small groups & clusters and separate clusters floating on the surface. Is this because of gases ~~trapped~~ produced by algae occupying empty egg chambers? Many such chambers with gas bubbles! Most with greenish jelly. One ♀ taken in process of laying eggs, other clusters at all stages of development up to fully developed embryos. Some may even have hatched. One dead "mature" larva noted floating on surface. Two postlarval young taken under adjacent logs. Both pools with supply of large Daphnians and large red Cyclops. Little sign of recent usage of pools by cattle. This area entirely given over to grazing has open blue oak woodland. One live oak present. At this date grass is short and green, soil dry and baked due to month long drought.

W. Reiner
1953

Taricha torosa

1 Mar. Calif.: Alameda Co., Arroyo Mocho, 1 mi. S Mt. Wallace, 3250 ft. In upper reaches of Arroyo at this time flows a copious supply of water ~~~~ over rocky bed with many deep pools. Digger pine - oak woodland. Cook, who has looked in stream on many occasions claims to never have seen a Taricha here but a single large larva. Today found one juvenile under rock. No adults. Stream looks idea but perhaps weather yet too cold. Stream 9½°C. at 1400 hrs.

2 Mar. Calif.: Contra Costa Co., Pinehurst Stream clear, moderate flow. Level up slightly from last week. Weather cold, clear, sunny. Frost heavy on exposed vegetation. 0920 hrs. temp. are: air 2°C, water 4½°C. No Taricha.

7 Mar. Calif.: Contra Costa Co. At Pinehurst stream clear even in deepest pools, flow moderate. Level of stream slightly down from previous visit. Weather warm, sunny, clear. Temp. at 1505 hrs.: air 18½°C, water 10½°C. No Taricha. Soil under boards moist. Viola beginning to bloom. Trilium also beginning to bloom. What is reason no Taricha breeding? ½ mi S Moraga single ♂ in water of flowless stream. Clemmys also

W. Reimer
1953

Triturus torosus

7 Mar. Calif.: Contra Costa Co. present. This specimen a large one. Do they eat Triturus? Below Dam of Jewel Lake saw several animals in spillway pool, several in tangle of branches and rotten cattails at foot of spillway, several in amplexus at lower edge of pool. These in shallow 3-4 in. deep water. Eggs present on 1 in. diameter stick in main pool - about 8-10 clusters, about half developed. Some granulosus also present but in fewer numbers than torosus.

13 Mar. Calif.: Contra Costa Co, Pinehurst
No Triturus. Stream cloudy from recent rains after long drought. Could examine only shallow water. 0900 hrs., air and water 6° C. Few seen crossing road (about ½ to 1 mile away) in open sunny areas. Weather cold, clear, sunny.

16 Mar. Calif.: Napa Co., Napa River, 1 mi. N, ¾ mi. E Yountville
Considerable search reveals only one small pool with egg clusters — about half developed to almost ready to hatch. Broad (about one mile), flat valley completely devoted to grazing. Most of trees cleared but large scattered oaks still abundant. Most of searching done in patch of oak woodland. River 30-50 feet wide, 2-3 feet deep with abundant

W. Riemer
1953

T. torosus

16 Mar. Calif.: Napa Co., Napa River, 1 mi. N, ¾ mi. E Yountville

quiet shallows and deep pools. Temperature of stream 12°C, 1030 hrs. Isolated pools of varying depths and size common along now unused river channels. Temperature in these 10°C. One, 5 x 25 ft., had about 1 dozen clusters attached to small twiglets (one half pencil-size) of wild rose bush. A few on other objects. Water murky, mud bottom. No adults in water. Only adult taken from under roots of dead tree. Also one subadult from under surface litter. Could herons be predators of this animal?

16 Mar. Calif.: Napa Co., 1¼ mi. E Aetna Springs, 700 ft.

One ♀ taken crossing road, 1 ♀ taken in stream. Extensive search revealed no others in stream. Egg clusters abundant. Most almost ready to hatch, some about one week old. Situation here appears to be same as where series of granulosus taken on this date. Gently rolling valley bottom with scattered oak-woodland. Grazing land. No digger pines on valley bottom but common even on lowest portions of adjacent nearby slopes. Stream 20 ft wide with shallows and numerous deep pools. Side streams 3 to 4 ft. wide also inspected. Eggs appear to be concentrated into a few places where water relatively

W. Riemer
1953

Taricha torosus

16 Mar. Calif.: Napa Co., 1¼ mi. E Aetna Springs, 700 ft. deep — though eggs not laid more than 18 inches (?) deep — and where a very slight movement of water is present. These conditions are obviously not necessary, eg. pools in Arroyo Mocho (See 1 Mar. 1953 for this species). Stream bottom clean; rocky or sandy. Water slightly cloudy. 1400 hrs. water temperature 12½° C. Both ♀♀ appear gravid though presumably all eggs now laid. Light rain falling.

16 Mar. Calif.: Napa Co., Pope Creek, 7 mi. E Pope Valley (town), 350 ft. Series of this species and one adult of granulosus taken from main stream and adjacent river bed pools. Eggs abundant some one-half developed, other only being laid. Many of torosus taken either laying or in amplexus. ~~Pinion~~ Digger pine-oak canyon with stream 20-50 feet wide. Some pools 5-6 ft. deep. Bottom clean, rocky or sandy. All animals in quiet or relatively quiet water along edges. Water clear. Temperature of water 1600 hrs. 12½° C.

16 Mar. Calif.: Napa Co., Calif. Hwy #37 between Napa and Monticello Numerous torosus walking across road in mountainous portions of this road during late afternoon following light rain. Mostly young.

W. Reiner
1953

Triturus torosus

21 Mar. Calif.: Contra Costa Co., Lafayette Reservoir and Pinehurst

At Lafayette counted 41 animals in 4 westernmost sections of dam apron. All in deep water. Water clear and quiet permitting vision to considerable depth. Weather: clear, sunny, warm. 1230 hrs. temperature of water 13½° C, air 14° C. ♀♀ and ♂♂ in water feeding near depth guage. 2 ♀♀ taken from water here appear very gravid. Egg clusters common on submerged cattails. Several taken, larvae appear ready to hatch. 3 other animals, one a gravid appearing ♀, taken under boards. At Pinehurst stream up 3 or 4 inches above last week and with at least twice the volume. Muddy. Only animal seen taken under bark on ground, #154 newly marked. At 1130 hrs. air temperature 11° C, water 9½° C.

28 Mar. Calif.: Contra Costa Co., Pinehurst

5 animals taken, 2 newly marked, 3 recaptures, # 10, 47, 149, 155, 156. Two of recaptures not handled or reclipped since 1950 at this season. Regenerated toes easy to recognize and not regrown to full size. 1000 hrs. air temperature 11½° C, water 10° C. Stream level down to normal from last week, slightly murky.

4 Apr. Calif.: Santa Cruz Co., East Waddell Creek, ¾ mi. S, ½ mi. W Big Basin Redwood Park Headquarters, 950 ft.

One hour search failed to reveal any Triturus or Rana in stream. It was decided that

J. Reimer
1953

Taricha torosa

4 Apr. Calif.: Santa Cruz Co., East Waddell Creek, 3/4 mi. S, 1/2 mi. W Big Basin Redwood Park, Headquarters, 950 ft. The sewage disposal plant had been dumping chemicals into stream thereby killing all aquatic life. In isolated side pool eroded into ~~sh~~ sandstone rock over which stream flowed found 3 adult ♀♀ and several egg masses attached to mosses. No mosses below surface in stream. No current in pool. 1130 hrs. pool temperature 11°C, stream 2 feet away at 9°C. Egg masses in stages 1(?) - 2 - 4 - 10(?). Pool clear except for little silt and mosses. See also T. granulosus; these being taken a few hundred yards downstream from torosus in dirty water pool. Douglas fir - redwood - tan bark oak forest.

4 Apr. Calif.: Santa Cruz Co., Bear Creek, 1 1/2 mi. N, 1 3/4 mi. E Boulder Creek (town), 650 ft. Here a series of 10 ♀♀ and 10 ♂♂ collected. Abundant. Stream about 20 ft. wide with shallows and deep pools. Sand - gravel - rock bottom. No amplexus seen but may ♀♀ laying. Many egg clusters present in various stages of development. 1445 hrs. stream temperature 13°C. In small side pools essentially isolated from stream and with yellow scummy algae present found 2 T. granulosus. One pool with temperature of

W. Reiner
1953

Taricha torosa

4 Apr. Calif.: Santa Cruz Co., Bear Creek, 1½ mi. N, 1¾ mi. E Boulder Creek (town), 650 ft. 14° C at 1500 hrs. Oak-laurel forest, alders along stream.

6 Apr. Calif.: Contra Costa Co., Pinehurst. Stream has receded slightly, clear, with moderate flow in most parts. At 0930 hrs. temperature of air 9½° C, water 9° C. Handled five animals, 125, 134, 150, 157, 158 of which last two are new. Weather: clear, sunny, cold. One ♀ taken in process of laying. These eggs will be followed through to hatching.

14 Apr. Calif.: Contra Costa Co., Pinehurst Stream clear, surface & most pools mirror quiet. 1200 hrs. temperature of water 11°, air 15° C. Weather clear, sunny, cool to warm. Seven animals handled two of which were recaptures #74 and 158. Several egg clusters seen, but only ♀ being amplexed by groups of 3 ♂♂.

22 Apr. Calif.: Contra Costa Co. No animals seen at Pinehurst. Heavy rain on 19th may have permitted adults to leave water. Eggs still spherical. 0900 hrs, air 14°, water 11° C. Stream clear with large areas of quiet water. Weather overcast and cool. At Lafayette 7 adults on first 4 sections of dam face. 1025 hrs., air 17½°, water 19° C. No adults except on dam. Side pool dry.

W. Riemer
1953

Taricha torosa

27 Apr. Calif.: Contra Costa Co, Pinehurst

Heavy rains during last night have built stream up to a boiling, muddy torrent about 1 foot higher than last week. Earthworms everywhere but no Taricha. 1415 hrs., water 12½°, air 13° C.

8 May No Taricha again. Stream clear and quiet, level lowest yet this season. Embryos at stage 36 with no sign of pigment yet. Madrone shedding blossoms. At 1400 hrs. air 14°, water 12° C. Half cloudy and sunny.

18 May No Taricha. Eggs laid 6 April now at stage 38 with well developed ~~egg~~ eye pigment. Ready to hatch. Stream clear, quiet. Weather overcast. 0945 hrs. air 12½°, water 11° C.

22 May Calif.: Contra Costa Co.

At Lafayette found none on dam face but water choppy and visibility poor. If animals were present they were deep. Saw one dive after surfacing in deep water by water depth guage. Water exceptionally clear. 6 taken under boards by valve pit. Of these only 3 adults. 1545 hrs. air 18½, water 19° C. At Pinehurst stream crystal clear but no animals seen. Eggs still intact and ready to hatch. Weather: partially cloudy, cool and bright. 1650 hrs. air 15½°, water 12° C.

W. Riemer
1953

Taricha torosa

29 May Calif.: Contra Costa Co., Pinehurst
1750 air 14°, water 12½° C. No Taricha, embryos not yet hatched or possibly a very few hatched. Stream clear and quiet.

4 June 1405 hrs, air 16°, water 14° C. Larvae just beginning to hatch.

16 June Calif.: San Luis Obispo Co., Lopez Canyon, 7 mi E, 2½ mi. N Arroyo Grande
10 adults taken in about 45 minutes from quiet portions of small stream averaging 6-8 feet wide, 2-6 inches deep. Water clear. Good algal growth. Small R. boylei present in considerable numbers, only one adult captured of two seen. Thick riparian growth.

Riemer
1953

Taricha torosa

Sept. Calif.: Contra Costa Co., Pinehurst

A visit to this study area between 1700 - 1725 hrs revealed that stream level extremely high for this season. Stream was continuous throughout study area with most of water in essentially still pools connected by areas of moderate flow. Deeper pools still at least ~~three~~ two feet deep. This appears to be about the state the stream is "normally" in about June. Only a single larva measured of 2 seen; 45 mm total length. As I remember them they appear to be longer and healthier looking than ever before in this area. 1720 hrs.: air 16½°; water 15½° C. Fish abundant.

9 Sept Calif.: Contra Costa Co. Lafayette Reservoir

At this study area 1745-1815 hrs. No adults on dam face or otherwise. No larvae seen but not adequately searched for. Single post larval young seen, several boards on wet soil examined in places post-larval young previously abundant. Newly metamorphed Hyla on edges of lake. Small Hyla abundant on wet soil. Immature R. aurora common also. Lake level relatively high reaching to first horizontal level of dam face. 1810 hrs.: air 16½°; water 22° C.

8 Sept. Calif.: San Mateo Co., 4½ mi. W South San Francisco

Single post-larval large individual taken under surface litter by S. F. Cook, Jr. The specimen was lost.

Riemer 1953 — Triturus torosus

Oct. Calif.: Contra Costa Co., Pinehurst

Visited this study area from 0915 hrs to 0945 hrs. At 0940 water of stream at 13°C (?). Found single (or two ?) metamorphosing larva. Gills reduced to about 3 mm, dorsum slightly granular and almost black showing little pattern. Venter pale yellow silver. No opercular opening and tail fin reduced, arising only at base of tail. Larva in shallow quiet water protected from current. Found hiding under leaves and conifer fronds and chased out into open by gently disturbing such cover. This is first time since study began in 1949 that and larvae have reached metamorphosing size in study area. Heretofore all water disappeared before fall rains commenced or stream flushed before larvae reached metamorphosing size. Now after first light fall rain stream with quiet pools with good flows between. Water level about as it would be in June in former years and same level or slightly higher than one month ago. Water slightly murky. About ¼ inch(?) of rain (the first of any consequence of the season) fell during previous day. Soil wet except on underside of logs and rocks where still quite dry.

3 Nov. Calif.: Contra Costa Co.

In following route outlined in Journal for this date it became obvious that Taricha is no present or at least not common E of Walnut Creek. Numerous individuals were seen on roads W Lafayette and

Richmond 1953 Taricha torosa

13 Nov. Calif: Contra Costa Co.

easily picked out while driving at same speeds as survey of roads to E of Walnut Creek. Of all the salamanders present these are least likely to be overlooked because of their size and bright ventral coloration. The conclusion is then that the species has its eastern range limit between Lafayette and Walnut Creek.

3 Dec. Calif.: Contra Costa Co.

With intention of determining how far eastward toward Walnut Creek this species existed S and E.F. Cook, Jr. drove, on a rainy evening, to Lafayette and then toward St. Mary's College as far as Burton. Several Taricha on road. Returning to main highway proceeded toward Walnut Creek to Saranap cut off and followed this southward and ~~west~~ eastward through Tice Valley to a junction with State Hwy 21 some miles S Walnut Creek. Only a few Taricha seen on road in spite of wet conditions. The eastern most animal taken 1½ mi. S, ½ mi. W Walnut Creek. A robust ♂ with partially swollen cloacal region. Specimen died and discarded. In shallow, long narrow valley between low hills. Surroundings appeared to be cultivated fields. None seen east of this point during several more hours of road collecting NE of Walnut Creek on Mt Diablo.

W. Riemer 1953-1954 Taricha torosa

31 Dec. Calif.: Contra Costa Co.

Lafayette Reservoir area with grass 2-3 inches high. Soil damp. Lake as low as I remember ever seeing it being several feet below flat portion of dam apron. There has been but little rain this season and none for several weeks. No Taricha found except one under a board by valve pit. None in water which was still and clear. No water or green growth in side pool. At Pinehurst stream level as in June or the same as on last visit. Clear, deep pools. Much litter of dead leaves over ground. Cold. Soil damp. Good flow between pools. No Taricha. Weather, clear and sunny.

1954

23 Jan. Calif.: Lake Co., Nice

Three adults brought in by R. Darby. Aquatic-type ♂ (#2258) has no xantho phores in iris which causes appearance of perfectly good T. rivularis eyes. ♀♀ normal. All taken from saw dust pile of lumber mill. Small stream nearby.

3 Feb. Calif.: Contra Costa Co., Briones Hills, 3 3/4 mi. N, 1 1/4 mi. W Lafayette At suggestion of S. F. Cook, Jr. visited this area with him and Zweifel. There are two small ponds of perhaps 1/2 acre in size along edge of road which connects

). Riemer 1954 **Taricha torosa**

3 Feb. Calif.: Contra Costa Co., Briones Hills, 3 3/4 mi. N, 1 1/4 mi. W Lafayette the head of Briones Valley with Vaca Canyon to the ♯ north. Both ponds are just over the crest on the N side. The crest is marked by a gate and cattle guard separating water-shed property on the south from private property on the north. The private land is administered by a Richard Townsend whose residence is situated less than one mile up the road from Vaca Canyon side. About one half mile NW of the crest where crossed by the road there are two ponds each about one acre in area. The first one comes to has considerable cattail growth and floating pond weed. T. torosa females were abundant and many involved in laying eggs. Those examined were in first to about sixth cleavage stage. The second pond is in a shallow natural basin, has no cattails or pond weed; it is muddy the other pond fairly clear. Torosa of both sexes abundant in water as well as egg clusters. Under boards around one end of pond — there are great quantities of such boards — I found abundant Taricha, of which many of the small subadults are granulosa-like in all characters. All adults are torosa ♀♀. I speculate as follows: There is in this pond a strong population of torosa as judged by the

Townsend
ubra
Valley,
ia, Calif.
31
r
s Tower
Francisco

Riemer 1954 Taricha torosa

Febr. Calif.: Contra Costa Co., Briones Hills 3¾ mi. N, 1¼ mi. W Lafayette

number of adults seen in a few minutes of collecting. The ♂♂ are in the water in the aquatic condition. The ♀♀ are both in the water laying and being amplexed, many are yet terrestrial but ~~and~~ ready to enter the water very shortly. Although some post-larval young Taricha are present I am not sure of their specific identity. The adults of both sexes of granulosa I suspect are in the water now, perhaps breeding. The numerous granulosa ~~found~~ found are all sub-adult size, many with small gills or gill stubs. Presumably they have recently left the water. If this is so the granulosa need only have adult competition with torosa during the short period during the spring when the latter are breeding. Invertebrate populations are also highest at this time. The larvae may not need to compete because of a possible difference in hatching time and hence size of food taken.

The following page illustrates several of the defensive ~~posture~~ postures assumed by Taricha from this locality. Curling of the tip of the tail was seen only in granulosa from Douglas Co., Oregon by Stebbins and myself. Torosa typically holds the tail straight. However, when properly stimulated

Riemer
1954
Riemer

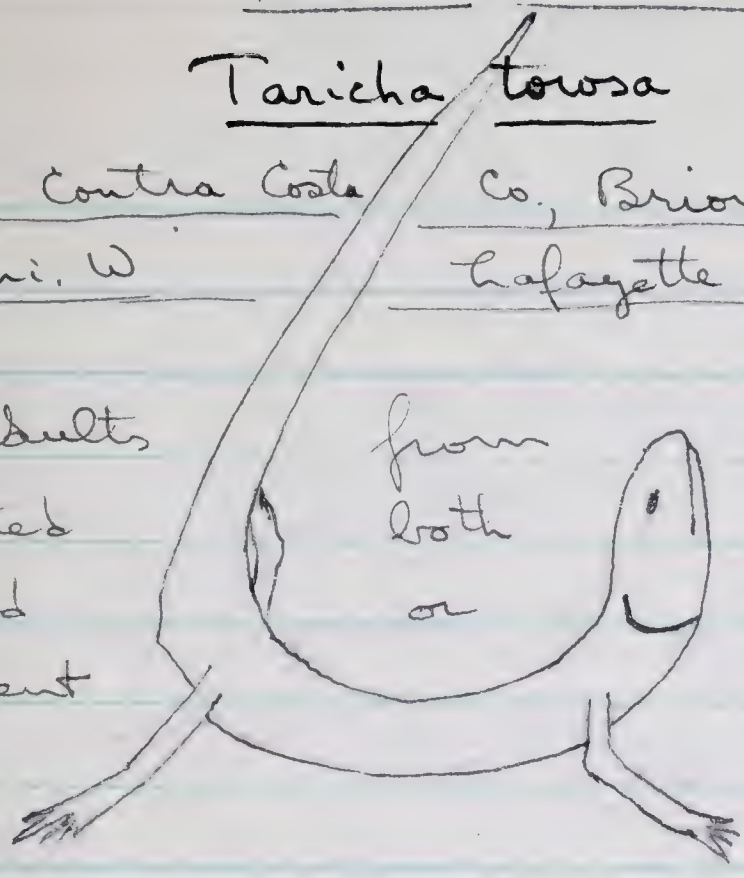
Taricha torosa

Feb. Calif.: Contra Costa Co., Briones Hills, 3¾ mi. N, 1¼ mi. W Lafayette

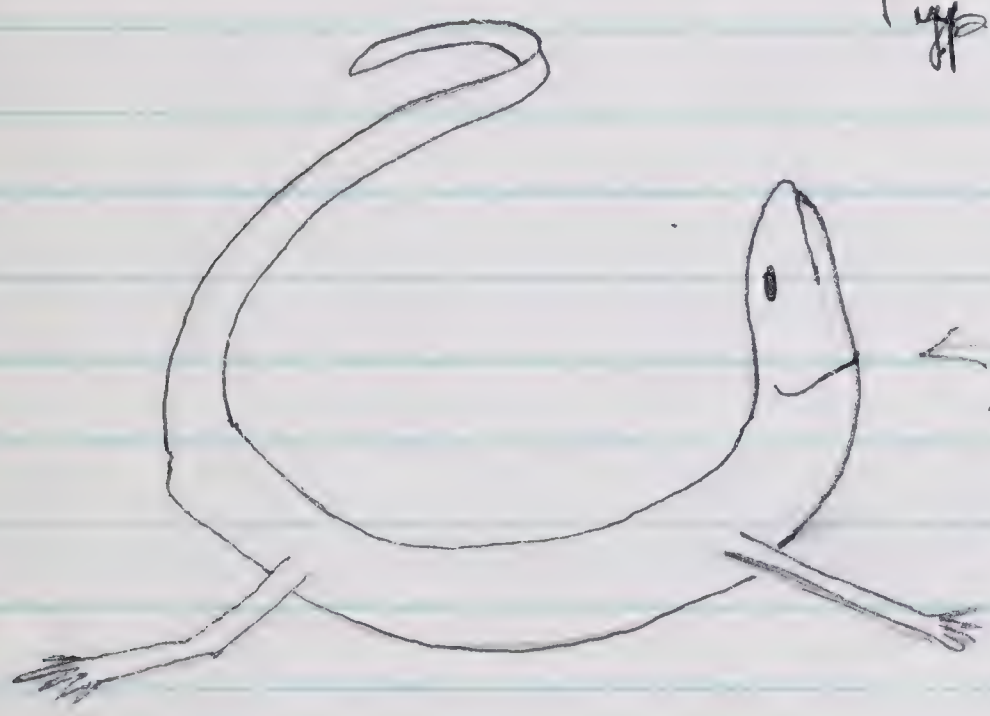
subadults reacted curled different day.

from both or

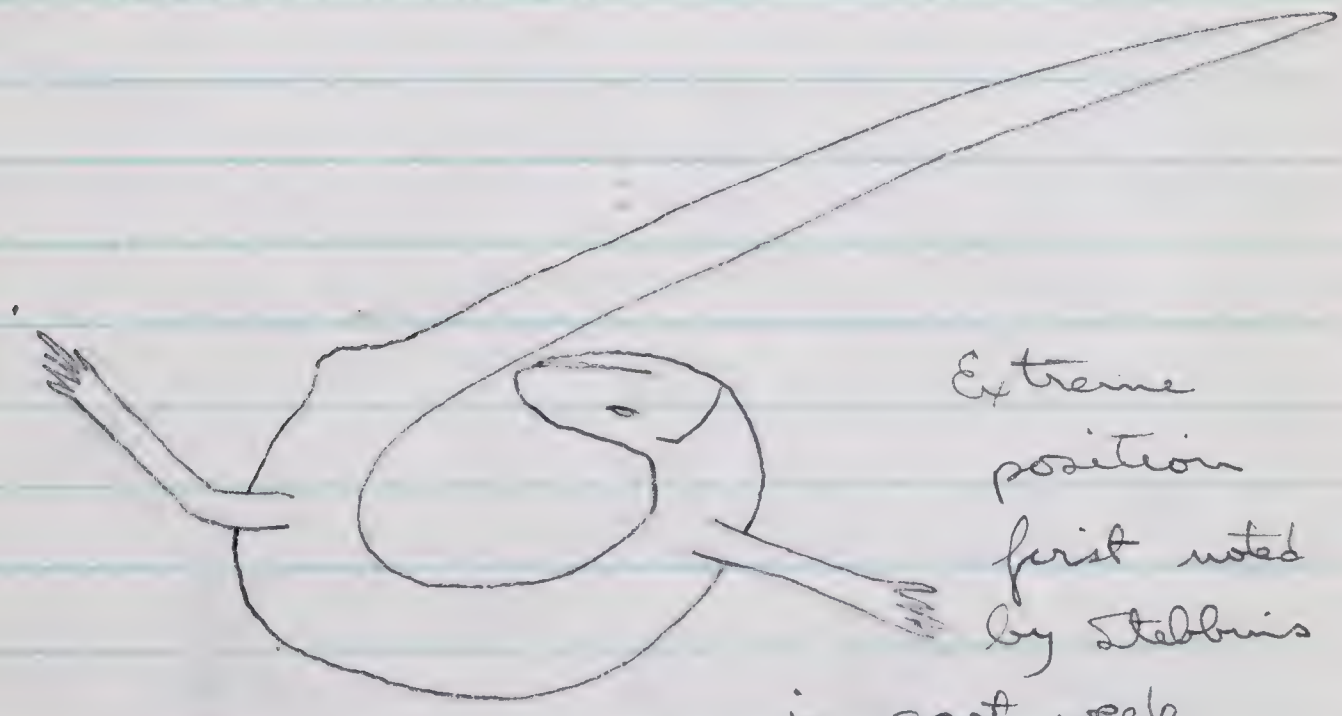
This population ways, i.e. tail straight at times the same



Typical of torosa



Typical of granulosa



Extreme position first noted by Stebbins in past week.

Defensive postures assumed by several of the Taricha from this locality.

J. Rieman 1954 — Taricha torosa

11 Feb. Calif.: Contra Costa Co., Lafayette Reservoir.
At this study area 0935 - 1020 hrs. At 0950 hrs., air 8°C, 10°C in surface layers of water. No Taricha seen on dam face by depth gauge, or in small pool in NW cove. Thirpool ½ full. One juvenile under board in cove. However one ♀ and several ♂♂ taken from small muddy pool, 2 - 3 inches deep at edge of dam (not on top of dam). 9°C in pool. Several of these apparently hiding in debris on bottom while others in amplexus. Is it possible that at such low temperatures the animals which must be in water are inactive on bottom in deeper parts of lake. Foggy

11 Feb. Calif.: Contra Costa Co. Pinehurst
At this study area 1045 - 1200 hrs. At 1145 hrs water at 7°C, air at 9½°C. Stream series of large, deep pools. Water clear. Violets first appearing above ground. Weather, cool and overcast. Check stream in study area and for twice length of study area downstream but found only one animal ♯10 a recapture

23 Feb. Calif.: Contra Costa Co., Briones Hills, 3¾ mi N 1¼ mi. W Lafayette
With permission of Mr. Townsend I revisited this locality. Breeding torosa captured in good numbers. Breeding granulosa also present. In addition granulosa larvae taken

J. Reimer 1954 **Taricha torosa**

23 Feb. Calif.: Contra Costa Co., Briones Hills, 3¾ mi. N, 1¼ mi. W Lafayette

All of the animals were collected from the large pond below the natural ~~spring~~ and seep. This pond is about 200 in diameter, is muddy probably in part due to the cattle. It is situated in a shallow basin in grassland with only a very few widely scattered oaks, only one of which is large. Several Salix (?) are clustered along the E shore. The water surface is clean except along parts of the edges where debris has accumulated about the grass which grows in certain places in very shallow water. Almost any sweep of a 12" net will bring up several adults of both sexes and species. Hence, the breeding adults are abundant and there is no apparent ecological separation of the species. Both are present in shallow water and in deep water. granulosa larvae were taken only at one place amongst the debris which had accumulated on the ~~submergent~~ grasses. torosa egg masses are everywhere, from one cell stage on possibly to stage 13 or 14, i.e. ~~early~~ late yolk plug. Only a few adults on land under objects and all torosa, some gravid. Many of subadults and postlarval one appear to be granulosa.

J. Riemer
1954

Taricha torosa

3 Feb. Calif.: Contra Costa Co., Briones Hills, 3/4 mi N, 1 1/4 mi. W Lafayette.

Now most all ♂♂ in the water breeding. I predict all will be or will have been in water within a week or at most two. Then the ♀♀ will leave the water followed later by the ♂♂. The granulosa on the other hand will remain aquatic through the summer. One ♂ large adult granulosa retains gill stubs of 1-2 mm. in length. Torosa larvae will metamorphose in July or August. Most ♂ granulosa larvae will remain in that stage until a year from now. If the adults compete for food it is probably only in the breeding season when both are in the water. The larvae are of different sizes at all times, and hence competition is much reduced.

The second large pond that has cattails and pondweed is now also muddy and also has both species present I think. They are only a few hundred yards apart. This cattail pond is deeper and has stickleBacks in it. It was not examined in detail.

D. Riemer 1954 **Taricha torosa**

Mar. Calif.: Contra Costa Co., Orinda Ridge, 1 mi. N 2 mi. E San Pablo Reservoir Dam

On this date R. Russell and I went to a pond at this locality ① to determine whether or not torosa and granulosa were both present, ② to collect eggs for the Zoology Department, ③ to collect a sample of both species of Taricha to determine possible food preference differences. The latter project is Russell's. The pond lies on the top of the ridge on Utility District Property leased to a Mr. Nemmers (sp?). We were led to the pond by a Utility District patrolman. The pond lies in a natural basin is about 2-3 acres in area. One side has a shallow slope (this is the side where most of the eggs and animals seen) the other a rather steep slope. There is no marginal growth except a small amount of water weed and algae. The water is muddy, vision is zero at depths of over six inches. The surrounding slopes are grassy with one or two widely scattered oaks. An old, completely collasped house lies close to one shore, an old team drawn tank wagon rots away on the opposite shore.

Egg clusters of torosa are abundant, about 2 gallons were collected with ease. Granulosa were not abundant in parts of the pond we could reach

Riemer 1954 **Taricha torosa**

Mar. Calif.: Contra Costa Co, Oursan Ridge, 1 mi. N, 2 mi. E San Pablo Reservoir Dam

It is suspected that they occupy the deeper portions of the lake at least at this time of day. We collected 3 as against a possible 30-40 torosa. Most of the torosa were released and only a small group collected as vouchers. The granulosa are like the ones from Townsend's pond in the Briones Hills in that the dorsum ~~th~~ has a greyish hue, the females are often grossly ~~stout~~ stout the limbs are conspicuously small and weak. These characters suggest even more strongly that these granulosa are as adults, permanently aquatic. Torosa was still occupied in laying eggs. Granulosa and torosa both extruded eggs in the laboratory, especially when ether anesthetized.

1 Mar. Calif.: Contra Costa Co., Briones Hills, 3¾ mi. N, 1¼ mi. W Lafayette

Russell and I proceeded to Townsend's pond in order to get a suitable sized sample of both species of Taricha for his food preference study. This was done. In addition a sample of contemporary aquatic organisms was gathered. In collecting the Taricha Russell found few or no granulosa along the pond edge. Most were from 3-4 feet of water. Is depth of water a possible ecological separation?

). Riemer 1954 Taricha torosa

1 Mar. Calif.: Contra Costa Co., Briones Hills, 3¾ mi. N, 1¼ mi. W Lafayette.
Torosa were still laying eggs but many females appear spent. Granulosa seemed to be more abundant but this may be a reflection of deeper collecting. Another larva of granulosa was taken. Both species were also taken from the second large pond which on second examination may well not be natural. Both species were present close to shore though torosa more abundantly.

2 Mar. Calif.: Glenn, Colusa and Lake cos.
Visited western edge of valley with Russell and Zweifel with objective of determining what species, if any, of Taricha inhabited this region. Drove up 99W to Orland, then west to Newville and then S to Wilbur Springs in southwestern Colusa Co. Then W to Clearlake and S to Calistoga. Drove into mountains westward toward McGraw Springs in north central Glenn Co. Hills steep, covered with little more than dense chaparral. Did not go as far as the Grent Springs. Drove in westward again at W central Colusa Co. toward Bartett Spgs. Road impassable before reaching Hough Spgs. At this point, where a bridge (under construction) crosses a large

954

Riemer 1954 **Taricha torosa**

mar. Calif.: Glenn, Colusa and Tehama Cos.
stream I asked a local rancher if Taricha present. He had seen one small one several months ago but none since. From this short survey under ideal collecting conditions I think that newts are absent or quite rare in the eastern foothills of the inner north coast ranges. The hills support grassland, chaparral and digger pine - oak woodland to forest. None of the mountain streams support any riparian vegetation and probably dry up completely early in the season. The soil is shaley, thin and probably holds little moisture. At the time of this survey it was raining ~~little~~ lightly and had rained for several days. Not a single Taricha was seen in this area on the roads. Other forms taken include several Ensatina shiltoniana, several Batrachoseps, a few Sceloporus, two small Rana boylei.

23 Mar. Calif.: Santa Clara Co., Stanford University
Went to visit Malcolm Miller and inspect areas where he has worked with migrating populations of Taricha torosa. He has two artificial small reservoir pools near top of ridge on Trampas Woods Rd. One is deep with steep sides and is similar in that respect

. Riemer 1954 Taricha torosa

3 Mar. Calif.: Santa Clara Co., Stanford University

to Lafayette Reservoir, but very much small. About 100 x 200 ft. A few dozen yards away is a second pool with a rather gentle shore drop (Miller guesses a 5 ft. max. depth). He considers this the best pool in area for seining purposes. A third pool at a slightly lower elevation on the road is impermanent and is said to have no regular population. These pools serve, presumably, as the breeding area for Taricha, which descend "Salamander Canyon" cross Corte Madera (?) Creek in Alpine (?) Canyon and then move uphill to last campos Woods pools. Descend is made in Fall following the beginning of the wet season. He claims the following first heavy rains animals are abundant only in the immediate vicinity of springs at the head of the "Salamander Canyon". As the season progresses they may be found at progressively lower points in the canyon. During the Spring, following breeding, they move up-canyon progressively disappearing as the season advances until all ~~presume~~ presumably reach the spring area where they aestivate. Movements are individual in nature and are not mass movements of bodies of animals. It was thought that one

3 Mar.

method of substantiating these observations and hypotheses would be ~~to~~ to mark all the animals possible leaving the spring area during the Fall. a different mark being used for different days or weeks. All of animals breeding in the seinable pool should be marked also. marking would perhaps best be done by a tattooing procedure. The following information would then be available. (1.) Do the animals emerging from the spring area actually migrate down-canyon? (2) Do they do so in waves corresponding with the time of emergance? (3) Do all of them follow the same general route? (4.) What is the route? (5.) Do all of them go to the same pool or pools to breed? (6.) Do all of those breeding in the seinable pool return to the same general or specific area? (7.) Do they move away from the breeding area in relation to the time of arrival? (8.) Do they ascend the canyon(s) in waves corresponding to the time of leaving the breeding pools? (9) What is the rate of migration? (10.) How do young and non-breeding adults act? (11.) How far do individual animals move? This marking and following would require steady work from October to June continuously.

W. Reimer 1954 Taricha torosa

23 Mar. Calif.: Santa Clara Co., Stanford University

Miller also showed me one other pond he calls the "Barn pond" which is deep and large about 4 acres in area. He claims most of animals enter pool from inlet ravine. This is a gentle shallow valley ideal for setting up a drift fence if such were considered desirable.

The following general observations and comments were made by Miller. Only about ½ of adult population breeds each year. It takes about 5 years to reach sexual maturity. They probably live for 30 years. Spent ♀♀ have large healthy looking oviducts — non breeding ♀♀ do not. Testis of maximal size and all white just prior to aestivation. Histologically undifferentiated. After emergence orange cap present anteriorly, posterior portion with ripening sperm in tubules. This area degrades after breeding and anterior portion enlarges, becomes white and undifferentiated. Animals in "Salamander Canyon" appeared to me to be somewhat like granulosa compared with East Bay animals in having smallish eyes, dorsal pigment low on face, a short snout.

D. Riemer 1954 **Taricha torosa**

10 April Calif.: Contra Costa Co., Lafayette Reservoir
A visit to this study area in the early afternoon revealed no Taricha present on dam face. Side pool above cove brimming full. No adults here either. Two adults and two young under boards by valve pit. Noted that young have face pigmentation much like granulosa.

5 April Calif.: Santa Cruz Co., Big Creek, Swanton
Stream with rapid flow and few places with quiet water except in vicinity of various barriers to flow such as fallen trees, etc. Stream about 15 feet wide, averages 1½-2 feet deep. Mostly well-shaded, flows through oak-laurel-madrone forest. Egg clusters common in protected places, some being laid, others in stage 35-36 (just prior to development of dorsal pigment stripes) Animals confined to quiet water along edges and in places not well lite. Three taken from under flat rocks. At least one of 48 collected here was a granulosa. These collected for Zool. Dept. and none saved by me.

15 April Calif.: Santa Cruz Co., Bear Creek, 1½ mi. N, 1¾ mi. E Boulder Creek (town), 650 ft.
Only five adults (two of which are laying ♀♀) collected here. ♂♂ with breeding pigment still present. Rare. Eggs in stages 1-35 or 36.

W. Reimer
1954

Taricha torosa

1 May Calif.: Contra Costa Co.,

During morning visit (0800–0930) to Lafayette Reservoir and Pinehurst study areas found no animals. On dam face water perfectly still, clear to 6–8+ feet and only a single animal seen in deep water. Small side pool reduced to 4–6 feet by perhaps 2 ft. deep. At Pinehurst saw no animals and no eggs. Stream level high (probably because of about 1½ in. of rain during week) and at about normal level for month of January or February. Water only slightly murky.

5 May Calif.: Santa Cruz Co., Big Creek, Swanton

Revisited this stream where a series of about 50 torosa taken three weeks ago. Now, even upstream from where previous animals collected, there are very few torosa left. Most of the 6–8 collected were from a single quiet, attached side pool. Granulosa appear to be more numerous but still scarce. Most of the 19 Taricha collected were of this species. One was in side pool mentioned above along with torosa. Stream level has dropped several inches, is clear and cool. Width is still about 12–15 feet. Animals were collected for Zoology Dept.

W. Riemer
1950

Thorius

28 Apr. Mexico: Guerrero: 3 mi. W Omiltemi, 8200 ft.
Three specimens taken from rotted log in semi-open mixed pine-oak forest on steep slope. Wood barely damp enough to squeeze water. Found in cracks of wood. Log difficult to pull apart because of lack of rotting in various portions ~~of log~~. Log in shade at time. Outer portions of log dry. Dorsal stripe golden brown in two ~~largest~~ larger animals, red brown in small one. Sides with heavy suffusion of very pale blue specks decreasing in number ventro-medially.

1 May Single small individual taken in damp log in canyon bottom. Dense broadleaf forest. Litter dry. Log barely damp enough to squeeze water.

Frogs

Riemer
1953

Amuran

July Brazil: 30 mi. N Rio de Janeiro, Petropolis

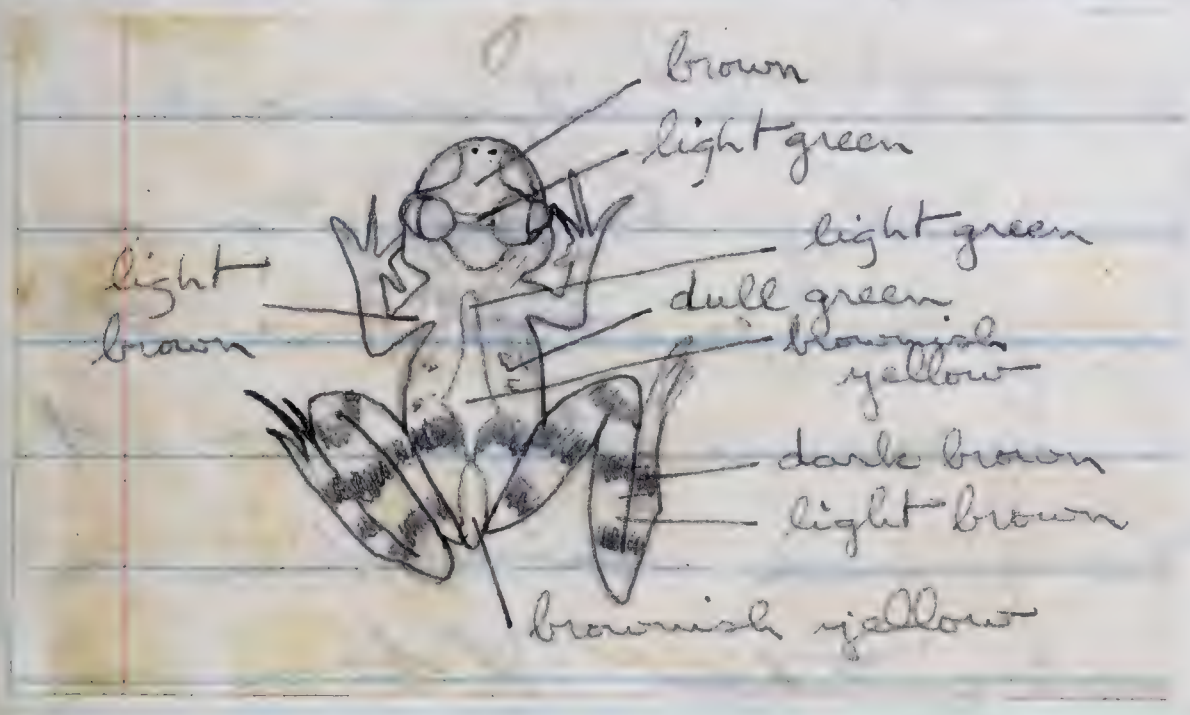
The following is a copy of original notes accompanying a series of 9 small amurans presented to M.V.Z., 21 Aug. 1953, by Sterling Bunnell and were collected by him.

"On July 21, 1953, from 6:45 P.M. to 7:15 P.M., I collected 9 frogs from a stony and moss covered bank about 10' high rising from a road behind the Hotel Quetandinha [spelling ?], Petropolis, Brazil. A rain of water opened over this bank and the rocky walls were dripping. It was quite dark but I could hear the frogs croacking [sic], a single, cricketlike chirp. This sound was continuously coming from one part of the bank or another. I could not shine the frogs' eyes with my flashlight but finally learned to recognize the frogs as they clung to the rocks. Their coloring blended very well with the wet rock and they were extremely hard to see, but their chirping directed me to their immediate vicinity. 3 or 4 might be found within a couple of feet of each other. When on the rock, they pressed themselves flatly against it and made no attempt to escape, apparently relying on their protective coloration. However, when on moss or grass, they held their body raised on their forelegs, and hopped away if a hand were moved to seize them. 2 frogs were found on the same rock within 2" of each other. These had their ~~body~~ bodies slightly raised. The frogs begin their chirping each day as darkness falls and continue it through the night. The region has an

Riemer
953

Amerom

July Brazil: 30 mi. N Rio de Janeiro, Petropolis
altitude of about 2500 ft., is densely forested. wp.
The climate is cool, foggy and damp. The m
temperature today was about 60° F."
The attached illustration is the original
traced over with ink for permanency. w-



ns

pil.

ork

W. Reiner
1953

Agalychnis dacnicolor

15 July Mexico: Sinaloa: 20 mi. N Mazatlan.

Taken on road at night. No rain for 2 days.
Colors, freshly killed (FT 2171): Dorsum uniform
bright light grass green with scattered
small silver yellow flecks. Venter with
on chin and throat grading to bright yellow-
orange on belly undersides and concealed portions
of limbs. Tympanum also green. Iris
black with flecks of cream radiating from pupil.
Lower eyelid opaque and green ventrally
but transparent with fine vertical network
of gold dorsally. Leading edge of lower lid
green gold.

W. Reiner
1953

Bufo sp.

29 June Mexico: Chihuahua: 7 mi. SW El Vergel (=Laguinita), 7800 ft.

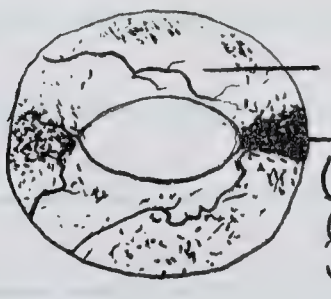
2 adults taken after dark while hopping over dusty soil in camp area. Little post-larval toads presumably of the same species are present everywhere in great numbers especially on wet soil near stream but also present up on rocky, dry, dusty soil of slopes several hundred feet or more from water. Toad larvae present in stream in large numbers, most of fairly large size. Bufo present as large larvae, metamorphosing young, post-larval young all in immense numbers. Small (1 inch) adults and large adults also present.

W. Reiner
1949

Bufo alvarius

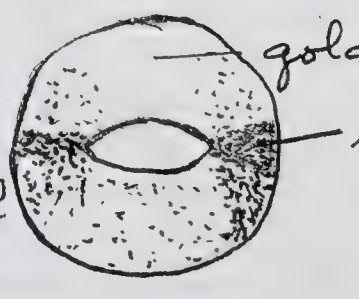
13 July Arizona, Pima Co., 1.5 mi. NNE Ajo.
4 specimens taken at night by lantern light along very small waste stream. Much black slimy tar-like crud in water and H_2S smell in air. Waste probably from copper mining. Stream flowing not far from base of sedimentation basin of mine. Edges of water with strong growth of Bermuda grass. Shade provided locally by Palo Verde and Mesquite trees but entire area surrounded by open creosote, saguaro desert. Animals taken with net, not wary.
268, 4-5 in. S-V length, colors in life; dorsum olive drab, tubercles olive-yellow-tan. Ground color grades to blue-green-gray on upper surfaces limbs and laterally on trunk. Venter, uniform dirty white. Seat patch not well delimited anteriorly. Conspicuous wart-like prominence behind angle of jaw, white in color.

268



rt. eye ant. ⇒

269



rt. eye ant ⇒

269, same coloration as # 268. Lower lids of both transparent.

J. Riemer
1947
1948

Bufo boreas boreas

4 mi. S. Lassen National Park, Calif. #36, Tehama Co., Calif.

5 Aug. One specimen taken on road at night about 2130. Several others believed to be same species seen in same area.

July 1948 5 mi NNE Laguna Beach in Laguna Canyon, Orange Co., Calif. Series of 9 half-grown animals taken at edge of swampy area. Ground, though not dried greatly, deeply fissured. Toads either in fissures and therefore out of hot sun or very near a crack in those areas covered by grasses. Animals extremely abundant and 9 taken picked up within two or three minutes.

W. Riemer
1949

18 Dec

Bufo boreas

Calif.: Marin Co., 1.5 mi. W, 0.5 mi. N Las Gallinas

Single specimen about two in. SV length taken under well rotted log just above stream. See T. granulosus for description of site.

W. Riemer
1949

Bufo boreas

22 Aug. Colorado, Jackson Co., 10.9 mi. W Hebron, Grizzly Creek

Specimen taken 1600 hours in small almost ~~non~~ flowing stream 6 ft. wide and 4-6 in. deep. Two ft. grass on one side stream, grove small aspen on other. Partially shaded by trees. Water clear with largely coarse gravelly bottom. Toad jumped into water from edge on my approach. Turned and facing shore rested on bottom about one ft. from shore. Conspicuous while resting on bottom. Weather warm and sunny.

Small animal taken 1630 in grass at edge of now non-flowing rivulet entering beaver pond 15 ft. away. Grass lush and about 2 ft. high maximum. Water quiet, clear, with muddy bottom. Spot shaded by willow-like tree. Aspen grove nearby. R. pipiens about area also.

Another adult taken same place as before at 1700 hours. See account at top of page for situation. Body temp. 18.4°C.

474, adult, colors in life; venter rich cream mottled with black. Vertebral stripe

W. Reimer
1949

Bufo boreas

22 Aug. Colorado, Jackson Co., 10.9 mi. W Hebron, ~~State~~ Grizzly Creek.

greenish white. Such stripe bordered by wide stripe of blackish olive. Rest of body dorsally and laterally basically a bluish gray with olive most medially grading to pale bluish milk ventrally and hence into ventral cream color. Warts on body tipped with deep brown and ringed with black. Carotoid glands brown. Seat patch with more yellow than rest of venter. Iris greenish gold.

#477, adult, colors in life; as in #474 except dorsal and lateral ground color more green gray than blue gray. Parotoid glands tan. Warts on body medium brown and black ring not so prominent. Iris green gold.

24 Aug. Colorado,

1345, large adult taken at edge of marshy area in small valley. Thicket of willow and grass at edge of and extending largely through marsh. Taken is water ½ in. deep and mottled with sun and shade. Body temp. 22.2° C. Water temp. 22.1° C. Scattered clouds, hence intermittently overcast. Also saw R. pipiens. Basin sagebrush beyond willows.

W. Reiman
1949

Bufo boreas

24 Aug. Colorado, Summit Co., 0.5 mi. ~~W~~ NE ~~N~~ ~~W~~ Frisco, 9100 ft. ±
#484, large adult, colors in life; venter gray white tending toward cream on chin. Deep gray to black spots on venter. Vertebral stripe milk bordeded by irregular stripe of blackish olive. Rest of dorsum gray olive grading to milk ventro-laterally and thence to ventral color. Warts tan on top ringed by blackish olive medially and black laterally. Iris yellow and pink buff - finely speckled - overlain with deep brown.

W. Reiner
1952

Bufo boreas

5 Apr. Calif.: Alameda Co., 1¾ mi. W, 2 mi. N Cedar Mt., Arroyo Mocho 1500 ft. A
Adult at very edge of large pool. Long strings of eggs (undeveloped) nearby in surface algae. Grassy bank (grass 2-3 inches high) with scattered oaks. T. torosus egg clusters about ready to hatch.

26 Apr. Calif.: Calaveras Co., 1 mi. E Vallecito, 1800 ft.
In a small reservoir about 100 ft. square noted vast schools of larvae in shallow muddy water along shore. Single 3 foot sweep of net gathered more than a hundred. These key out in Stebbins - Amphibians of West. No. Amer. but do not exactly fit descriptions given. Dorsum blackish-olive, venter slightly lighter because of stippling with golden xanthophores. Intestine not visible. Tail musculature with prominent golden mottling, especially along dorsal edge. Dorsal fin with scattered melanophores but ventral fin without. Iris predominently black but with gold markings. Average total length about 40 mm.

23 Mar. Calif.: Calaveras Co., Calaveras Big Trees State Park.
Single young toad sitting on small patch of saturated soil at base of rock on talus slope. Except for similar occasional patches of a few square inches of bare soil entire slope covered with snow.

D. Reimer
1953

Bufo boreas

30 Mar. Calif.: Sonoma Co., Warm Springs Creek, ½ mi. N, 1 mi. W Skaggs Springs

Pair of adult toads found in hollow under fragment of tree branch. On exposure ♂ rapidly hopped down burrow nearby (6" away). Finally emerged from burrow when cavity prodded with stick. ♀ peculiarly light pigmented. Soil sandy and but slightly damp.

W. Riemer
1953

Bufo boreas

13 Nov. Calif.: Contra Costa Co.

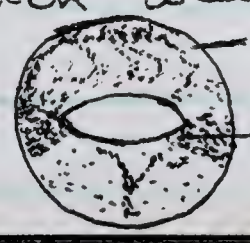
Only single adult collected at 1 mi. NE Walnut Creek. Species common over much of route outlined in journal but heaviest concentration present in the several miles NE of Walnut Creek. Here both young and adults present.

W. Riemer
1949

Bufo cognatus

14 July Arizona, Pima Co., Rowood R. Stebbins detected chorus just after midnight. Followed sound to source at foot of wall of sedimentation basin of copper mine. Small, muddy, shallow puddles under a few mesquite. Substrate a gray-white clay-like slime. Away from puddles quite sandy. Large number (probably 2 dozen) calling from small area. Took 7. See R. Stebbins notes for call pattern and body temp. Call, very loud, deafening and very much like pneumatic drill except perhaps slightly more musical in tone. Tended to stay concealed beneath or among growths of small plant in water. Vocal sac large as animal itself (it seemed) and transparent unpigmented as inflated rubber balloon. Sac well above water when calling.

#272, colors in life, dorsal ground color olive gray, tubercles tipped with tan. Blotches outlined with black, central area same as ground color except darker. Rust outlining upper lid viewed from above. Venter greenish white with yellowish in seat patch area. Nuptial pads deep purple brown.



R eye

Vocal sac green;

out → purple - gray

W. Reiman
1949

Bufo cognatus

14 July Arizona, Pima Co., Rowood

271, colors in life, dorsal ground greenish buff, spots blackish olive, tubercles tipped with red-brown. In other respects same as # 272

273, colors in life, dorsal ground green with gray. Blotches darker and black bordered. But little rust on upper lids. Considerable pale yellow on seat patch. Otherwise same as # 272

24 July Arizona, Cochise Co., 32 mi. NE Douglas, U.S. Hwy 80

Single small specimen taken in dry stream bed under railroad bridge. Much green grass and other low annual herbage about, all standing water at least 100 ft. away though damp soil spots frequent elsewhere.

371, young, colors in life, venter milk on throat, bluish milk on body anteriorly, dorsal ground gray with tan, blotches light green olive with gold luster bordered by black, tubercles tipped with yellow-tan. Soles of feet yellow-orange, ~~toes~~ iris gold.

24 July Arizona, Graham Co., 16.4 mi. NW Pima, U.S. Hwy 70

Two taken of many present in artificial pond beside road. ~~Alt~~ Also present and also calling were B. insidior, woodhousii, S. hammondii. Call similar to pneumatic

W. Reimer
1949

Bufo cognatus

24 July Arizona, Graham Co., 16.4 mi. NW Pima, U.S. Hwy 70
drill. Easily taken by hand when blinded by flash light.

377, adult ♂, colors in life; venter cream, vocal sac blackish red, dorsal reticulum milk, blotches olive green. Spades and toe tips black, nuptial pads brown. Iris gold with greenish anteriorly and posteriorly.

376, adult (?) ♂, colors in life; venter milk, reticulum milk, ground color dorsum light olive, blotches olive, tubercles yellowish tan, iris gold. Nupcial pads tan, toe tips and spade dark brown to black.

W. Riemer
1953

Bufo coccifer

6 July Mexico: Durango: 8 mi. E Canatlan, 6300 ft.

A series taken at various points between here and Durango City. This is most northern station of 3 from this locality in life: collected. Colors Seat patch pink. Dorsal blotches light gray and dark olive green, light areas white to greyish cream. Cranial crests and supra-cilliary ridge light brown. Iris gold. Gular pouch dark gray.

W. Riemer
1949

Bufo compactilis

1 July

Utah, Washington Co., Virgin River, 2.6 mi. SW Springdale

Series of 18 toads taken at high noon along red sandy and muddy river bank, along irrigation canals of cultivated onion fields and in alfalfa field. 10 of animals, expired from heat and dead perhaps ½-1 hour, colored as follows.

194, ventrally, milk color; stripe across upper lids light tannish-yellow; parotoids grayish-light-olive; dorso-lateral tubercles with buffy tips; concealed areas of hind limbs (those areas concealed when hind limb drawn up as when at rest) not colored differently than ventral surface. Iris light gold.

199, ventral color light yellow, stripe across upper lids milk color medially darkening laterally, parotoids dark-gray-olive posteriorly, dorso-lateral tubercles yellow-tan tipped, concealed areas of hind limbs as under parts. Iris light gold

200, ventrally milk color, stripe across upper lids buffy cream, parotoids buffy cream with gray, dorsal tubercles tipped with red-brown, concealed areas hind limbs as ventral color. Iris light gold.

201, milk ventrally, eye lid stripe buffy cream, parotoids buffy cream with gray,

W. Riemer
1949

Bufo compactilis

1 July Utah, Washington Co., Virgin River, 2.6 mi. SW Springdale # 201, (cont'd) dorsal tubercles brown tipped, concealed areas hind limbs yellow especially upper surface foot, ventral surface foot, anterior and posterior surface thigh. Iris light gold.
Other numbers pickled before colors could be recorded.
One taken within 4 ft. of water, stream 50 ft. wide. Flow rapid, about 5 ft. per second. Taken where substrate largely bare red sand with moderate stand sapling willows(?). Red of dorsum blended well with substrate. Probably would not have been seen had animal not moved. Another 2 animals taken in shade in grass at edge of artificial canal of moderate flow.
One taken at edge alfalfa field 33.6° C.
Small one taken at edge of stream on sandy bank among willows(?) 30.4° C

3 July Utah, Washington Co., 13.0 mi NW St. George U. S. Hwy 91 Hopping about on dirt shoulder of road. Soil damp after light rains. Record only. About 2130 hours.

3 July Utah, Washington Co., ~~Bloomington~~ Santa Clara R. 2.5 mi. S Saint George 6 specimens taken on dirt road at dusk. Body temperatures 22.0°, 22.5, 22.5° C; in all cases

W. Reiner
1949

Bufo compactilis

3 July Utah, Washington Co., ~~Bloomington~~ Santa Clara R., 2.5 mi. S Saint George animals of adult size, about 2 inches snout to vent. Probably out as result of light rains during preceding day and night. Abundant. Associated with Bufo woodhousii in apparently equal numbers. Surrounding area of more or less dense vegetation of shrubs and bushes and grasses.

3 July Utah, Washington Co, Bloomington See B. woodhousii this date. 5 animals taken in same situation as woodhousii. Body temp. in R. Stebbins notes. What ecological factor segregates these toads? Is there hybridization?; the typical animal in each case appears very distinct yet occasional specimens appear to be debatable as to identity, even in life. The fact that both occur together in same habitat means they can not be conspecific.

1 Aug. New Mexico, Grant Co., Mimbres, State Hwy 61 Two specimens taken on dirt road after dark. Apparently had rained heavily during afternoon.

#411, adult, colors in life; venter butter yellow with gray cast, seat patch yellow with reddish. Dorsum gray with old rose

W. Riemer
1949

Bufo compactilis

1 Aug. New Mexico, Grant Co., Mimbres, State Hwy 61
tinge on anterior half of body. Rusty on upper eye lids. Concealed areas of hind limbs including dorsal surface foot yellowish. Tips of toes of hind feet deep reddish brown. Iris gold.

rt. eye
ant. →

J. Reimar
1949

Bufo exsul

19 & 20 June Deep Springs, Deep Springs Valley, Inyo Co., Calif.

Deep Springs represented by large, moist to soggy, area of grassland at foot of rocky, steep, essentially barren mountain at SE corner of valley floor. Grassy area lies between mountains and alkali sink. Natural and artificial channels penetrate grassy area to drain springs and soggy ground. Such channels run from springs to near sink. Toads most abundant in and about such canals and especially mid way between springs and sink. Myers claims 1% may be away from water at a maximum distance of 6 ft. Abundant upto 20 ft. from water, occasionally seen upto 100 ft. away, is personal impression. Would not be surprized to find individuals any place within moist grassy region. Some tracks noted in early morning in very dry sand some distance from water. Seem to like to sun (?) even at noon but especially in early morning perched atop cow chips or small mounds of earth. Inhabit clear fresh looking water as well as slimy sulphurous channels, pools in cattle foot prints and coffee colored non-draining pools.

Riemer
1949

Bufo exsul

9+20 June Deep Springs, Deep Springs Valley, Inyo Co., Calif.
Some substance in one of pools had killed all grass within two feet of pool but toads present. No toads in immediate vicinity springs though impressed by no real difference in nature of habitat. Extend all the way toward sink as far as water goes. Examined only first spring at NE of sink. Great numbers present. Stebbins count at night of 25 in 10 ft. of channel. My count at 1100 was 150 in 100 ft. of channel 2 ft. wide 1 ft. at deepest point. Only those in or at edge of water included in count. Why such huge number? Is there no real predation? No predators seen though weather excellent for Thamnophis, for example. Myers estimated total population at 600 - 800 toads (1942?). Without hesitation population at this spot estimated at at least 10,000. Several seen to feed on a very abundant water riding fly. Most often with head just out of water at edge of bank would snap up food with tongue, head slightly dipped each time. Occasionally one would swim at surface into windrow of such flies and feed from that position.

J. Riemer
1949

Bufo exsul

7-20 June Deep Springs, Deep Springs Valley, Inyo Co., Calif.
More frequently would simple swim through windrows to new site at bank. Feeding observed at 1030. Chirping call also heard at this time occasionally though not at other times. Scaphiopus hammondii present and calling with snoring sound during evening. Why are exsul so small? Competition for food in such concentrated population? Insect life abundant in some areas of grassy area inhabited.

W. Riemer
1949

Bufo insidior

23 July Arizona, Cochise Co., 2 mi. NNE Douglas, U.S. Hwy 80
Two specimens of several present taken at edge of roadside ditch puddle. Stopped at spot because of Scaphiopus hammondii in road. Heard loud chorus of B. cognatus with another weaker call penetrating on occasion. Investigation of puddle (25' X 10' approx.) showed 3-4 cognatus calling from water. Insidior calling from amongst tufts of green grass closest to water. Not easy to pick out an animal in green growth. Does this represent protective coloration? It seems effective to me with artificial light yet is the color effective to nocturnal predators? No correlation between calls of insidior and cognatus, i.e. after a period of silence caused by our activity either species would begin to chorus first, continue, or cease quite independently of the other. One insidior came to base of gas lantern placed amongst vegetation close to edge of pond to feed on attracted insects. Seen to take several flying ants(?).
#369, adult ♂, colors in life; venter milky with bluish cast, gular sac, back to insertion of forelimbs purplish. Dorsum a thin

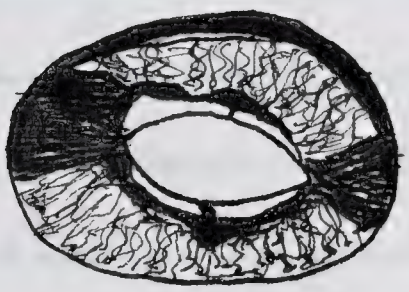
W. Riemer
1949

Bufo insidior

~~24~~ 23 July Arizona, Cochise Co., 2 mi. NNE Douglas, U.S. Hwy 80
(#369 cont'd)
yellowish-green with jet black reticulum. Tubercles deep lemon yellow, tipped with brown. Soles of forefeet reddish orange.
Iris gold.

rt. eye
ant. →

#368, adult ♂, colors in life; same as #369 except gular sac reddish purple. Iris gold.



rt. eye
ant. →

J. Riemer
1949

Bufo punctatus

1 July — Utah, Washington Co., Virgin River, 2.6 mi. SW Springdale #202, large numbers of very young punctatus (?) larvae (probably just hatched) in quiet, protected water at edge of river. Substrate largely bare red-brown mud. No vegetation. Water 1-2 in. deep in direct sun. Rock outcrop and mud bar form edge of pool. Larger tadpoles of #202 from small, largely isolated pools among ~~rocks~~ rocks on opposite side of river. Again substrate red-brown mud, no vegetation, water 1-3 inches deep in direct sun most of day. Several S. hammondii ~~tadp~~ tadpoles of good size also present.

#203, eggs of punctatus (?), taken in same pools as larger larvae. Single, resting on mud bottom and completely coated with muddy film looking much like small roundish lumps of soil on bottom of pool. Close inspection in hand revealed in most a small black embryo.

3 July — Utah, Washington Co., 4.6 mi. SSW Saint George Toad chorus from small seepage area below irrigation ditch. About 2200 hours. Not wary since could approach within inches of singing animal. Perhaps this is

W. Riemer
1949

Bufo punctatus

3 July Utah, Washington Co., 4.6 mi. SSW Saint George
resulted of large number present and
inspired confidence. Series of 25
collected, many amplexing pairs.
Voice, a high pitched, very rapid trill.
In number, close by, sound is almost
painful to ear, seemingly rattling
tympanum. Many crickets (?) of area
seem to have same call during
daylight hours. Associated with
S. hammondii there being several
present. Scaphiopus not affected
by punctatus calls and being
much more easily frightened.
Why no woodhousii and ~~cog~~ compactilis
present in area?

16 July Arizona, Santa Cruz Co.,
Series of about 12-15 taken after dark in
vicinity small rock-walled pools remaining
in narrow channel of stream ~~pool~~ paralleling
roadway below Peña Blanca Springs. Several
taken on bare rock walls but most in
and about tufts of course grass growing
in damp sand in channel just above and
below pools. Many more present but not
collected. Also present in same situation
were Hyla arenicolor and Microhyla
carolinensis. Larvae present in pools.

W. Reiner
1949

Bufo punctatus

16 July Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs # 305, colors in life; general dorsal ground color gray-tan, tubercles tipped with red. Soles of fore feet yellowish. Iris reddish gold. # 306-312 similar except those with large number of tubercles appear considerably redder.

17 July Arizona, Santa Cruz Co., 1½ mi. W Peña Blanca Springs 2 adults taken on wet dirt road after dark. Had rained during afternoon. Scaphiopus also taken in same place.

W. Riemer
1953

Bufo punctatus

6 July Mexico: Durango: 1½ mi. N Morcillo, 6300 ft.

Small series taken on highway following heavy rains. Taken at night. B. cognatus also present but in greater numbers. These much less pink than one taken at Parral, Chihuahua. Colors ± 2039 ↑ when freshly killed: Dorsum grey with olive-brown tinge. Tubercles red tipped with black surrounding base. Iris reddish gold. Venter milk with black circles. Seat patch yellowish-red.

Rieimer
1953

Bufo typhonius

16 Aug. Panama (Canal Zone): Forest Reserve

Small series collected by Sterling Bunnell of which 3 here catalogued. Related verbally the following notes. "Collected 4:00 pm. Paved highway through forest each side of highway with grass. Forested slope — covered with leaves. Bluff — stream bank. Saw one with yellow spot on nose jumping in leaves. Second on slope 35-40°, in grass at edge of road". Catalogued as numbers 2225-6, 2229.

W. Reiner
1949

Bufo woodhousii

28 June Utah, Davies Co., 2.0 mi. SW Joseph.
Stebbins heard very faint burring noise about 2130 while in bed. Thought it was an amplib calling. Trying very hard I could detect only very faint burr. Gusty zepher may have aided sound in reaching us. Speculated that sound similar to that sometimes coming from high tension wires - E. Stebbins. With gas lantern walked in direction of sound. Calls intermittant but continuous enough to easily trace. Apparently no ventriloquistic quality at all. (At one time) spotted source of call within 2-3 ft. from distance of 75-100 ft.). First arrived at small pool about 12 by 3 ft. at widest points. Had been isolated from other water about by gravel and rock dump. Sedges or cattails (?) sparsely represented, water to 4 inches deep. One ♂ called as we approached (not with particular care). Disturbed but remained on surface where easily spotted with flash light. Perched in shallow water with entire head protruding. Dove under water and ~~so~~ swam 3-4 ft. then remaining under water. Easily spotted against mud of bottom. Taken with net as was another

W. Reiner
1949

28 June

Bufo woodhousii

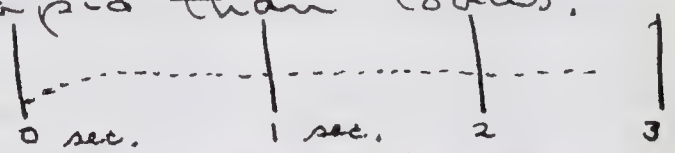
2.0 mi. SW Joseph, Sevier Co., Utah

♂ also on bottom. Also young R. pipiens taken on bottom. Heard calling again and went several hundred yards to reservoir (?). Calling stopped at our approach. Sat down on bank with light shielded and waited for calling to resume. About 7-8 minutes before started. Continued at short intervals for several minutes. Then I wrote intervals down while R. Stebbins watched clock and dictated. Though his voice low I thought it was ~~interphasing~~ interfering with frequency of calling of toad, i.e. increasing interval between calls. For data on calls see R. Stebbins notes. Then moved over to where toad calling with intent of watching animal while calling. Watched for 5-10 minutes before calling began. R. Stebbins was giving lower call with less rapid vibratto. At first call flashed on lights. Silence. Toad with entire head above water, appeared to be sitting in shallow water with thick mat of grass on surface, about 4-5 ft. from shore and 6-8 in. from bleached log projecting into water. Stebbins standing on shore while I and E. Stebbins sat on low bank above shore. Eye of

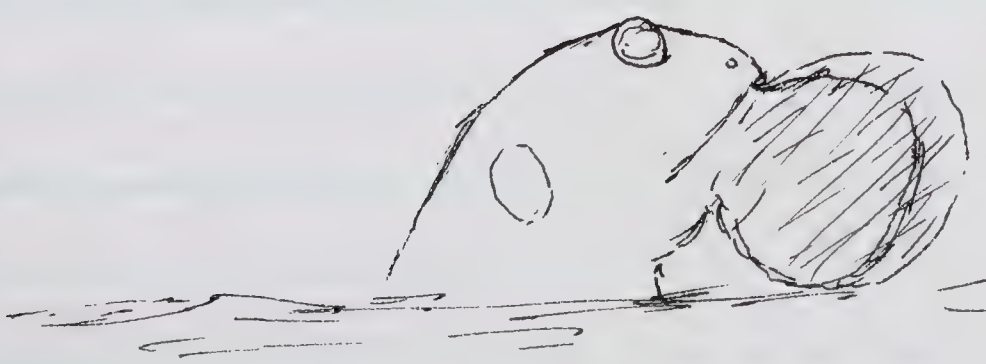
w. Reiser
1949

Bufo woodhousii

28 June Utah, Sevier Co., 2.0 mi. SW Joseph toad reflected reddish-pink light. Lights kept on animal for 5 minutes ~~to~~ but no escape attempted nor sound made. Gular sac partially inflated and pulsating, rate of pulsation recorded. Soon after lights doused, and prompted by Stebbins' call, toad responded. ~~Inspite~~ Despite of lights toad continued to respond to imitation. Would respond to vibratto without tone as readily as imitation but would not respond to whistle of proper tone without vibratto. Did respond well though Stebbins call lower and less rapid than toads. Call of toad as follows



Gular sac of toad during call blown out as in diagram. Grayish and almost transparent appearing like over-blown toy balloon.



See notes R. Stebbins for more accurate diagram

3 July Utah, Washington Co., Santa Clara R., 2.5 mi. S Saint George See account B. compactilis this date. Body temp. of ~~several~~ two adults taken on road at dusk (2035 hours) 21.8°, 22.7° C.

question, I'm no longer sure whether he is referring to the unhappily extensive overlap of taxonomic characters (my original interpretation) or to the equally unhappily many taxonomic arrangements and rearrangements that have been fitted to the floridana complex. Gosh I wish Archie were there. In lieu of his presence, I suggest that my original interpretation be assumed. For "much deplored taxonomic aberrancies", "much deplored morphological overlap" might be substituted.

Bill, I'd like to add a first page acknowledgement to the University of Missouri Zoology Department. They actively supported the preparation of this manuscript, assumed all expenses involved and will purchase my reprints. Whether it is added to Footnote 1 or appears as a title footnote does not matter to me. How about: "He ("the junior author" if separate) gratefully acknowledges the support of the University of Missouri Zoology Department where he was employed during the preparation of this manuscript."

I think that does it. Let me hear.

W. Riemer
1949

Bufo woodhousii

3 July Utah, Washington Co., Bloomington At sunset (about 2000 hours) took several specimens in cultivated fields near shore of Virgin River. In wheat, alfalfa and weedy fields. Not necessarily along irrigation ditches with water, though fields damp from rains. Associated with Bufo compactilis in same situation. Body temp. in R. Stebbins notes. See also B. compactilis this date.

9 July Arizona, Yu Co., Yuma, 0.2 mi. E Center St. on 1st St. See R. Stebbins notes of details of locality. #258, ♂, colors in life. Gular sac blackish-maroon. Ventral surface, milk. Soles of fore-feet dirty maroon, digits tipped darker. Vertebral stripe milk color, dorsal tubercles tipped with maroon. Dorsal aspect generally gray-green mixed with cream laterally. Yellow in concealed parts of hind limbs especially hind surface thigh. Iris gold to light gold, almost silver below pupil. Tympanum greenish-yellow buff.

#257, ♂, colors in life. Gular sac blue-green maroon. Soles of fore feet tan maroon. Many of dorsal tubercles not tipped with special color. Dorsal aspect light olive green, lighter laterally. Seat patch yellowish. Otherwise same as # 258.

W. Riemer
1949

Bufo woodhousii

9 July Arizona, Yuma Co., Yuma, 0.2 mi. E Center St. on 1st St.
#256, ♂, colors in life. Seat patch reddish yellow. Vertebral stripe greyish-white-cream. Dorsal aspect light greenish olive fading rapidly laterally. Nuptial pads deep rose. Otherwise like #257. A generally faded animal.

15 July Arizona, Santa Cruz Co., 2 mi. NNW Nogales, State Hwy 89
2 toads taken in late afternoon under old chunk of tree in yard of Forest Service Station. Soil beneath wood dry on surface at least. Many webs and egg sacs of black widow spider in hollows of under side of wood.
#283, immature, colors in life; ground color of dorsum olive-gray, tubercles tipped with red-brown. Venter white. Iris gold

24 July Arizona, Graham Co., 16.4 mi. NW Pima, U.S. Hwy 70
Single animal taken of many present. Calling from bank at edge of water. Not concealed. Also present B. insidior cognatus, Scaphiopus hammondii. All calling. Call of woodhousii very similar to S. couchii as described 23 July 1949.
#375, adult ♂, colors in life; venter cream, seat patch yellowish cream, gular region purplish brown. Vertebral stripe and other dorsal light patches milk color.

W. Riemer
1949

Bufo woodhousii

24 July Arizona, Graham Co., 16.4 mi. NW Pima, U.S. Hwy 70 (#375 cont'd). Dorsal ground color light olive. Yellow weakly present posterior side of thigh. Nuptial pads reddish dark brown. Iris gold with greenish cast anteriorly and posteriorly, yellowish dorsally and very pale below pupil.

29 July Arizona, Navajo Co., Pinetop, State Hwy 173, 7315 ft. Two young individuals believed to be this species taken in short grass near edge of pool just at NW edge of town. Associated animals: Thamnophis elegans, T. tigrinum. #408, young, 3/4 in. S.V. length, colors in life; gular milk, body venter bluish white, soles orange-yellow, dorsal ground color tan with olive, black spots surrounding red tipped tubercles, vertebral stripe faint. Iris gold.

W. Riemer
1953

Diaglena spatulata

14 July Mexico: Sinaloa: 9 mi. N Mazatlan, 100 ft.

Dick found 1st specimen calling from small snag (?) at edge of temporary pool at about noon of hot sunny day following very heavy morning rains. Heavy rain also previous night. By next day at noon no anurans present at pond whereas several species present in considerable numbers day before. On second evening (ie. this date) following raining one ~~this~~ ie. ~~date~~ no anurans calling, but 5 ♂ additional individuals of this species present in trees and shrubs near pond. Found by eyeshine. Most or all about 4-8 feet from ground on vertical or near-vertical stems. Two taken about 12-18 inches apart. No attempt at escape. Other hylids similarly present only in trees on this night.

2155 in laboratory at M. V. Z. ~~#~~ on 5 Aug. fed 3 large meal worms. These taken only when larva crawled under rostral area of frog when head very close to ground. Mouth opened and larva "shovelled" into mouth. It would appear that stimulus to open mouth or feed is presence of moving object below depressed rostrum and touching same. Head appears to be characteristically

W. Reiman
1953

Diaglena spatulata

14 July
~~14 July~~ Mexico: Sinaloa: 9 mi. N Mazatlan

held close to substrate providing ~~and~~ and inviting thigmotactic ~~refugee~~ refuge for insects. Such prey appears to be out of line of sight of frog.
Where larva attempted to crawl onto either fore- or hind-limb of frog it was immediately and violently "kicked" off by a sudden extension of the limb. In case of hindlimb larva once tossed at least 12 inches away. Once, also, worm pushed into mouth with fore-limb.
Temperature of about 13° in bone room causes animal to be lethargic, indeed almost torpid with eyes presently 3/4 closed.

W. Reiner
1953

Eleutherodactylus sp.

2 July Mexico: Chihuahua: 7 mi. SW El Vergel (= Nagunita), 7800 ft.

#1983. Colors in life: Venter white on belly purplish-pink on gular, underside of arms and legs. Dorsum green with purplish brown spots. Iris pale greenish gold. Horizontally elliptical. Taken well after dark from frog-sized cavity in pitted rock surface. Rock about 6 X 3 feet by two feet high, lichen encrusted, on pine forest mountain slope several hundred feet from small stream. Cavity and rock essentially dry although rain had fallen in late afternoon. Soil damp except in shelter of rocks and other cover where it is bone, powder dry. At least 8-10 others calling within radius of ½ mile. Captured by stalking sound until within few feet of caller.

W. Reimer
1950

Hyla

3 Apr. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.

This species seen only in immediate vicinity of the spring below camp. Koford has collected four and myself only one. Of these all were on the ground at the edge of the bank above the spring or perched on the wooden railing around the edge of the pool. Others I have seen on the lawn like area close to the spring. None however have been seen in the water except one which I frightened in. Unlike Rana pipiens it did not immediately dive for the mud of the bottom but swam rather leisurely along the bottom not attempting to conceal itself. The hind legs were extended alternately rather than simultaneously as in Rana.

W. Riemer
1950

Hyla

10 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose

759, color of dorsum, general yellow-green; venter almost transparent with invasion of yellow-green specks from dorsum. Iris golden. Faint tan and sooty indistinct marks on back. Taken under damp rotten log in perpetual shade at entrance to limestone bat cave in sink in pine woods.

760, dorsum golden cream with irregular golden gray spots. Sides & trunk completely transparent. Venter whitish. Iris light gold with violet iridescence. Taken under small piece of wood at edge of small muddy pool in opening in pine woods.

28 Apr. Mexico: Guerrero: 3 mi. W Omiltama, 8200 ft.

851, dorsum brown, area about eye sooty brown, venter of body cream, mottled with light brown on throat. Iris gold. Taken in water of rivulet flowing in tiny cascades through dense forest with many tree ferns present. Flow very slight in small pool where taken.

852, dorsum golden brown with sooty brown marks, light tinges of greenish about eyes and dorsal ridges. Throat grayish brown. Belly and hind limbs ventrally pinkish to yellowish buff, more pinkish posteriorly. Taken on leaf mat in

W. Reimer
1950

Hyla

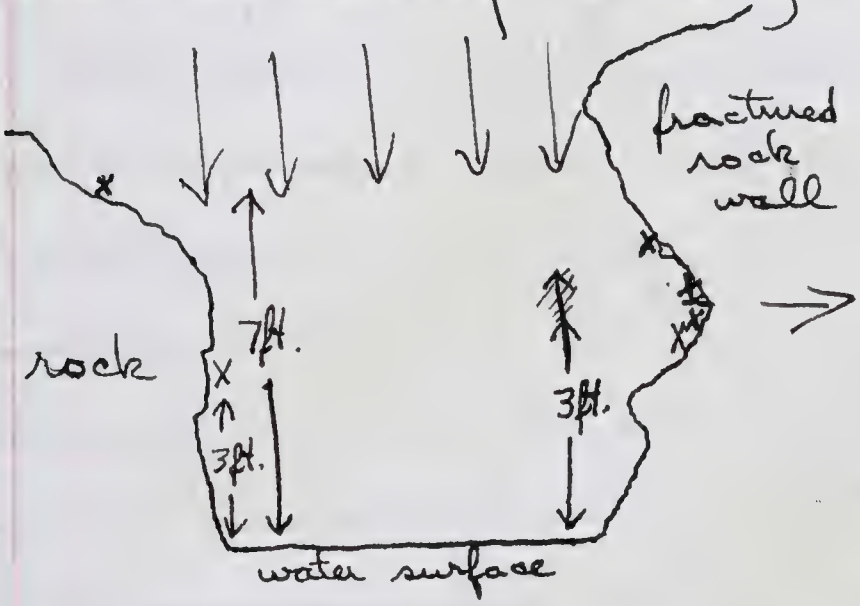
28 Apr. Mexico: Guerrero: 3 mi W Omiltemi, 8200 ft.
dense broadleaf forest near edge of tiny rivulet.
late afternoon, leaf mat dry.

1 May Five specimens of two species taken in small rivulet or on dry leaf litter adjacent to water in canyon bottom. Dense broadleaf forest. Steep slopes.

W. Rieman
1949

Hyla arenicolor

16 July See below 17 July.
17 July Arizona, Santa Cruz Co., 1 mi. NE Pena Blanca Springs
Six
Four individuals found on rocky wall forming edge of small pool. Three completely exposed while fourth in narrow hole in rock. All in situation where overhanging rock ledge would shade resting spots throughout day. How do animals know such spots will be protected from sun? Are they home ranges maintained by animals who just happened to hit a well shaded spot when setting up range? What becomes of those choosing sunny spot the first time.



Pool 3 ft by 8 ft.
Animals all within 4 ft longitudinal distance.

Cross sec. of pool. "X" indicates position of Hyla at 0930 hours. Animals almost invisible against rock which they match almost perfectly. They rely highly on protective coloration; one can almost touch animal even with a rapid movement without its attempting escape. One on N. side pool half in sun. Touched and single leap carried animal to point 18 in. above water

W. Riemer
1949

Hyla arenicolor

1 July — Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs but immediately above water's edge. Rocks in full sun, hot. Animal hopped back up steep rock faces in about 4 twelve inch leaps clinging to perpendicular surfaces occasionally, back to spot within few inches of original resting spot. This time picked shaded niche in rocks. Do these animals have regular niches used day after day for resting. These animals to be left undisturbed until tomorrow or day after to see if they will use same spots for daytime concealment. Colors various in these six animals being almost uniformly grayish or blotched and seemingly adapted to surface on which resting. R. Stebbins took several color shots, close up and of general situation.

16 July — Several specimens taken in small "tanks" (pools) in rock-walled stream channel, at night by lantern light. No singing. Larvae in pools. About equal numbers taken on bare rock walls above pools and about course tufts of grass growing in damp sand in vicinity of pools. Easy to capture making no attempt to escape. Also present B. punctatus and M. cardinensis

W. Reamer
1949

Hyla arenicolor

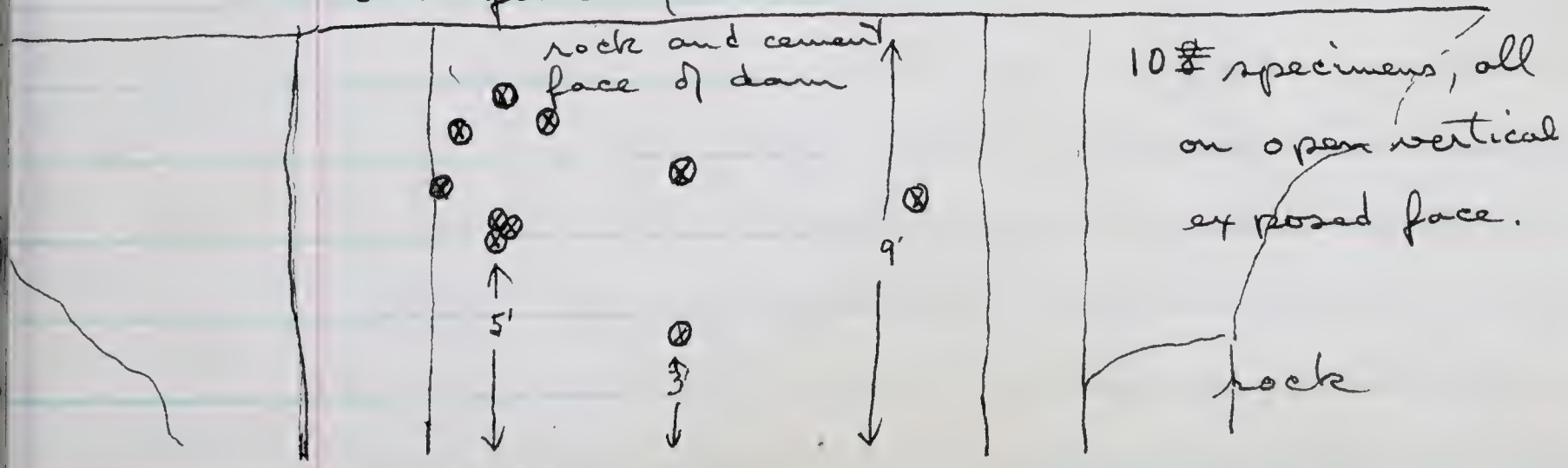
16 July — Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs # 304, colors in life; dorsal ground color creamy gray, spots deep olive-green. ~~Venter white~~ yellow otherwise ^ cream. Orange granules over entire venter. Are these parasites? Yellow in concealed areas of hind limbs and where femur appressed against body. Ventral surface thigh deep red. Gular area (♂) purple-gray.

greenish gold
black indicates melanin

left eye ant. ←

21 July — Arizona, Pima Co., Hdqtrs Santa Rita Experimental Range

Below dam forming swimming pool, just up canyon from Station, a small tailed specimen hopped from beneath shelter of grapevine(?) and rocks. Easily taken but noted that suction pads of feet not very effective. Then noticed adults on face of dam.



W. Riemer
1949

Hyla arenicolor

21 July Arizona, Pima Co., Hdqtrs Santa Rita Experimental Range.
Beneath center of dam several damp seep spots but not standing water. Dam face at time exposed to rather strong light though overcast has excluded direct sun all morning. Why do these animals rest on exposed surfaces? Why never close to ground? Colors of specimens before disturbed ranged from purplish-red to olive-gray. and although did not match rock color very well were well camouflaged by pattern, texture of skin, luster and general tone of colors. Because of unusually smooth surface of dam as compared to natural unmortared rock walls spotting of animals not difficult. Only one nervous during observations and moved about over face of rock walking usually with body at 45° with perpendicular; thus:

Direction of movement apparently made little difference as to position of body. Not attempts at escape made. When picked up or just before each animal ~~exuded~~ eliminated a rather large quantity of water through anus. Does this mean animals are saturated

W. Riemer
1949

Hyla arenicolor

21 July Arizona, Pima Co., Hdqtrs Santa Rita Experimental Range

when they take up daytime posts and rely on such moisture and its evaporation to maintain suitable moisture level and temp. thru out day. On several occasions croaked after being up in sack. These appear to be hydrophobic animals in daytime. This is not characteristic of coastal forms. All following colors in life.

#342, venter milk, dorsal ground olive with yellow, blotches deep green with olive, tympanum gold, concealed portions of hind limbs and groin lemon yellow, iris pale gold, many orange speck on venter; are these parasites?

#343, venter milk, dorsal ground lavender gray, blotches dark green olive with gray, rest of colors as in #342

#344, dorsal ground lavender-pink-gray, blotches green-gray, rest as in #342 except gold of tympanum limited to postero-ventral portion, remainder dark gray.

#345, dorsal ground yellow tan, blotches dark olive green, little yellow on hind limbs and groin, iris pale gold above but almost whitish below, otherwise as #342

#346, dorsal ground color gold shaded tan, blotches green-gray, rest as in #342.

W. Reiner
1949

Hyla arenicolor

21 July Arizona, Pima Co., Hdqtrs Santa Rita Experimental Range

#347, dorsal ground tannish gray, blotches tannish olive, light purple gular, yellow on hind limbs and in groin not strong, rest as in #342.

#348, dorsal ground lavender-tan, blotches yellowish sooty, rest as in #342.

#349, dorsal ground buffy-cream-yellow, ~~blotches~~ blotches dark olive-gray, gular sac light purple-black, rest as in #342.

#350, dorsal ground yellow-tan-gray, blotches olive-dark gray, gular light purplish black.

#351 newly metamorphosed, 11 venter cream, dorsal ground grayish olive, tympanum not evident, yellow of hind limbs present but weak, iris deep gold, few of orange abdominal specks. Could such a young terrestrial animal be parasitized unless parasites picked up in water or directly from parents?

W. Reiner
1953

Hyla arenicolor

4 July 1952 Mexico: Durango: 10 mi. NW Las Adjuntas

Two individuals captured by Stan Weitzman bore this data:

FIELD NO. SW VII:4:1952-2

Locality: 10 mi. n.w. of Las Adjuntas
Durango Mexico
Date: VII:4:1952
Collector: S. Weitzman

Collected on an outcrop of rock about 500 ft above a stream that might permanently have water. At time of capture larger frog was sunning itself on a pink and gray granite like rock. Dorsal side of frog was colored the same (ie pink & gray mottled). Two minutes after capture (the frog being held in a closed hand) it turned creamy white and brown on its dorsal surface. Originally under sides of legs were a light yellow, belly creamy pinkish yellow, throat white mottled brown.

SW VII:4:1952-2

These are now labelled with my numbers 1767-1768.

29 June Mexico: Chihuahua: 7 mi. SW El Vergel (=Baquiteta), 7800 ft.

2 adults taken on large rock 10-12 feet from stream. One unspotted. #1916 dorsally pinkish gray with light-olive-green spots. Groin, hind portion of thighs, and ventral side of lower leg lemon yellow. Anal region white.

30 June Single adult taken at base of large pinkish-gray rock with gray and green lichen cover. Heavy short rain had just fallen. Toads and rocks colors appear to be good match.

W. Riemer
1953

Hyla arenicolor

5 July Mexico: Chihuahua: 6 mi. S, 16 mi. W San Francisco del Oro

Single adult taken on rocks at head of barranca in gently rolling oak scrub and cultivated land. Early afternoon. Sunny. Light rain had just fallen. Colors: Dorsum tan with olive-brown spots. Venter yellow in armpit, groin and on concealed portions of thighs. Tympanum conspicuous, reddish gold.

W. Reiner
1953

Hyla eximia

1 July 1952 Mexico: Durango: Rio Hondo, 1-2 mi. N Las Adjuntas. Collected by Stan Weitzman and Jack Lattin (fisheries and ~~etol~~ entomology respectively). 3 specimens bore this data:

Locality: Rio Hondo, near Las Adjuntas (1-2 mi N.)
RioHondo trib Rio Presido, Dgo. Mexico Date: III:1:1952
Collector: S. Weitzman & Jack Lattin

found in dead tree trunks while searching for insects

These now bear my numbers, 1769-1771.

8 July '53 Mexico: Durango: 6 mi. WSW Las Adjuntas, 8500 ft.

Two taken along with larger series by Zweifel from marshy area of seep in meadow in pine-oak forest. First attracted by chorusing Chorus local with perhaps 15 individuals. Next closest chorus in roadside rain pools about 1/4 - 1/2 miles away. Colors of 2057 & 2058 freshly killed. Dorsum green with gold and brown longitudinal bars ~~on~~ on one; greyish tan with light brown longitudinal bars and blotches on the other. Mask greyish brown. Belly white; throat, groin and ~~concealed~~ concealed portions of thighs yellow. Iris reddish gold.

W. Riemer
1947
1948

Hyla regilla

Subway Caves, Shasta Co., Calif.

9 Aug. '47 Single animal captured about 70 feet from mouth of lava tube in very dimly lit situation and resting on rock covered floor. Color: deep brown.

10 Apr. '48 Wildcat Canyon, Tilden Park, Contra Costa Co., Calif.

Individual found in cattail marsh near Jewel Lake. Green phase.

Individual hopping along path N end Jewel Lake and at 100 ft. or more above lake level. Distance from lake several hundred yards. Green phase.

W. Reimer
1952

Hyla regilla

5 Feb. Calif.: Del Norte Co. 2¼ mi. S, 2¼ mi. E Fort Dick
large adult ♂ under bark (damp) of redwood stump in cut-over clearing, on sunny side of stump. Hyla chorusing from edges of clearing. See Gerhonotus account.
Two more ♂ adults under bark of same stump.
One with A. ferreus 2 inches away.

1 Mar. Calif.: Butte Co., 2¼ mi. W, 3½ mi. N Magalia
Egg masses of tablespoon-size attached to small fragments of vegetation in artificial pools in mine quarry. Bottom rock and silt.
No growing vegetation. One mass in late tail-bud stage, rest still egg shaped. Rana boylii and Hyla taken in pools.

June Calif.: El dorado Co. Grass Lake (nr. Luther Pass)
Extensive area of marshy meadow with loud chorus of frogs of this species in mid-morning. Weather cold, clear, sunny, with snow patches remaining on road. Elevation of about 7800 feet. Utterly failed to see Hyla even with most carefully arranged stalks.

1 Mar. Calif: Alameda Co., Arroyo Mocho, 8 mi. S, 4½ mi. W Midway, 1500 ft. Under oak branches on damp soil a short distance from pools described under T. torosus found 5 adult Hyla crowded together in small depression. Another one by himself several inches away. Also present, Batrachoseps and T. viridis. Air temp. 8° C. Are animals escaping cold?

W. Reiner
1953

Hypopachus sp.

14 July Mexico: Sinaloa: 9 mi. N Mazatlan, 100 ft.

Taken among dead leaves in wet streambed (but not with running surface water). Colors of ± 2162, freshly killed. Dorsum grey brown vertebrally, red brown dorso-laterally. Ventrally seat patch and underside of limbs purplish-pink, belly white with light brown mottling, gular purplish to blackish. Iris essentially black.

W. Reiner
1949

Microhyla carolinensis

16 July — Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs

Two specimens taken in course grass tufts at edges of rocks resting on damp sand in vicinity pools of water in narrow rock-walled stream channel. Also present were B. punctatus and H. arenicolor. Tadpoles in pools.

17 July — Arizona, Santa Cruz Co., 2 mi. W Peña Blanca Springs

Large numbers taken at cattle tank. Most in muddy cow foot prints near edge of pool. Easy to capture by hand though can jump rapidly. Several taken hundred feet or more from water heading toward it. Had rained heavily during afternoon and at time of capture lightening heavily. Severe downpour immediately after captured. Several heard and one watched calling. Call weak and like a sheep calling from next hill. Gular pouch sooty. Will they start breeding because of rain?

19 ~~18~~ July — Arizona, Santa Cruz Co., Peña Blanca Springs

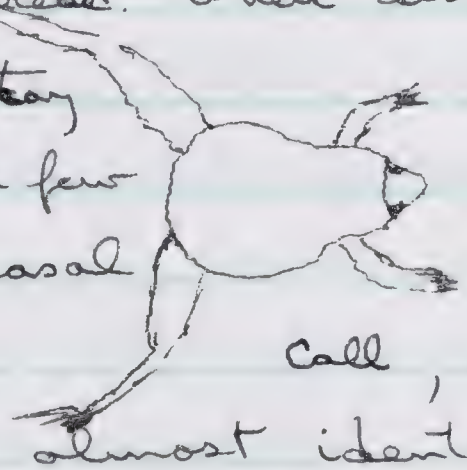
They did breed! In hoof prints in seepage area close to camp found several clusters of eggs. Clusters float on surface of water in single layer. Pigmented black except for small area at vegetal pole. See R. Stebbins notes for details.

W. Riemer
1953

Microhyla mazatlanensis

21 July Arizona: Santa Cruz Co., Peña Blanca Springs

A single adult calling from muddy pool, 10 X 50 feet by 4-6 inches, about 300 feet NE of Springs tank. Last evening Frank Blair recorded a good chorus at this pool and probably collected most of the animals present. Tonight's adult calling from very center of pool while floating on surface with legs outspread. When disturbed would dive but not stay submerged for more than a few minutes. Responded to a nasal buzzing noise rather nicely.



Call, as close as I can recall is almost identical to call of small Hypopachus from Mazatlan. The latter may be on a slightly higher pitch.

Springs area is mesquite-oak woodland.

W. Riemer
1949

Pseudacris nigrita

27 June — Utah, Utah Co., shore Utah Lake, 1 mi. W Provo
1000–1020
Species common. 5 taken in 20 minutes by myself. Habitat of sedges and cattails 4-5 ft. tall. Where sedges thin or absent grasses and other short herbage 4-6" tall cover ground. In such grasses near sedges where species appears most abundant. All taken on ground and discovered when jumping from underfoot. Weak jumper; about 6" each leap. Must watch ground carefully. Many small flies, grasshoppers, etc. in area disturb vegetation in same manner as species when jumping. Hot and sunny. Seem confined to grassy areas where soil damp. None seen in thick sedges or where grass absent. R. pipiens associated and equally abundant. Much more rapid jumper.

29 July — Arizona, Navajo Co., 0.8 mi. NNW Lakeside, State Hwy 173
Two individuals taken in grass at edge of small lake just below dam of Lakeside Lake. Not common or at least none others seen in rather complete examination of ponds about. R. pipiens abundant.

22 Aug. — Colorado, Jackson Co., Rand, State Hwy 125
Specimen taken in cropped green grass at edge of small quiet stream in cultivated valley. 1330 hours. Intermittently overcast

W. Riemer
1949

Pseudacris nigrita

22 Aug. Colorado, Jackson Co., Rand, State Hwy 125 and clear, cool and warm. Scattered clouds. Easily taken by hand.
470, adult, colors in life; venter white with creamish green tinge. Dorsal ground color golden tan with olive cast. Dorsal blotches gray-brown with deeper sooty brown margins. Olive cast to all of dorsum. Supralabial region silvery green to cream. Iris gold.

23 Aug. Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Peak, State Hwy 14

Large group of young taken in pond along with similar group of R. sylvatica young. For complete discussion of situation see that species this date. All conditions apply equally well.
483, young specimens, a general discussion of over 2 dozen animals, colors in life; venter cream to golden, occasional tinges of greenish, tendency for most posterior portion of abdomen to be darkest i.e. most golden. Dorsal ground color golden tan to golden olive to tannish gray; first category dominating in number. ~~Animals~~ Blotches from almost complete absence to very prominent. Color always darker than ground and with

W. Riemer
1949

Pseudacris nigrita

Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Peak, State Hwy 14

either brown ~~&~~ or olive hue or both. No correlation between distinctness & blotches and ground color. Lateral dark stripe forming eye mask anteriorly always present and from deep olive to sooty brown in color. Width & such stripe varies and often broken behind head. Upper lip light, golden with either orange or greenish tinge. Iris gold to copper, slightly more melanistic ~~than~~ in darker animals than in light ones.

W. Reiner
1950

Rana

10 spr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose
765, color of dorsum, tannish gray with small buff and sooty specks and small spots. Blotches deep, rich, olive green. Eye stripe black. Venter white with slight mottling on lower lip. Iris gold. Taken under small piece of wood with three R. pipiens 30 ft. from water of muddy pool 100 ft. in dia. Wood on grassy bank. Surroundings of pool well trampled by livestock. Pool in opening in pine forest.

W. Riemer
1953

Rana sp.

25 June Mexico: Chihuahua: Rio Papigochic, Miñaca, 6300 ft.

A series of tadpoles of two size classes taken in muddy main stream. Common. Most taken in sweeping water-weed mats. Stream from six to 20 feet wide, rarely one foot deep. Bottom rocky or muddy.

12 July Mexico: Sinaloa: 14 mi. by road SW El Batel, 4200 ft.

I captured a single young individual on rocky water fall area. Zweifel took several others from pools upstream. At least a half dozen adults were seen perched in small cavities (2-3 inches in diameter and about 1 inch deep) in rocks abutting against small (6 ft. diameter), shallow (2-4 inches), pool in old abandoned taro(?) patch. These dove into water and hid in crevices of a loose rock wall and were not captured. These frogs appear similar to R. pipiens, appear to occupy a similar niche but lack dorsal spots and green color of pipiens.

12 July Mexico: Sinaloa: 10 mi. by road NE El Batel, 6400 ft.

Single frog of above described form taken from small stream flowing through a series of rocky pools. Water shallow (to 6 inches). First seen when lazily swimming down stream. Others seen perching in rock cavities not captured.

W. Riemer
1953

Rana sp.

12 July Mexico: Sinaloa: 10 mi. by road NE El Batel, 6400 ft.
#2104.

Venter immaculate except for faint grey marks on labial margin. Dorsum deep greyish-olive. Dorso-lateral folds, supra-labial folds cream with buff tinge. Other lateral light areas dirty cream. Hind limbs mottled dark purple brown and light olive. Iris gold.

W. Riemer
1952

Rana aurora

5 Feb. Calif.: Del Norte Co., ½ mi. E, ½ mi. N Fat Dick

Subadult in small rivulet, steep bank covered with moss-covered downed timber and tangle of young second growth of small trees and shrubs. Little overhead cover. Much moss and ferns.

W. Riemer
1953

Rana aurora

13 Nov. Calif.: Contra Costa Co.

Only three specimens seen were taken in same general area as were Ambystoma, Kellogg Creek, 3 mi. W, ½ mi. S Byron.

W. Riemer
1951

Rana boylii

12 Aug. Calif.: Marin Co., 1½ mi. SSE Alpine Lake Dam, Cataract Canyon Species abundant along edges of deep pools. 4 taken. See Dicamptodon account for details.

18 Aug Calif.: Sonoma Co., Skaggs Springs, Warm Springs Cr. 1 mi. W, ½ mi. N
Adults, metamorphosed young, metamorphosing young and larvae present in main stream and in tributary rivulet. Adults common but least abundant. Younger forms collected for Zweifel. Striking light patch on young post-larval young on top of head from orbits to ~~snout~~ snout. Is this present in other areas. Metamorphosing young particularly abundant under floating algal mats in sun. Water depth here 3-4 inches.

W. Reimer
1952

Rana boylii

3 Feb. Calif.: Mendocino Co., 9.4 mi. SSE Willets

One large adult on muddy, sandy bank above stream but near edge of stream. Attempted escape into stream. Stream with moderate speed, strong current. Muddy. 30 ft. wide. No frogs on rocky shoals nearby.

5 Feb. Calif.: Del Norte Co. 2¼ mi. N, 6½ mi. E Crescent City

Single juvenile under rock in seep next to small stream in dense young redwood, Doug. fir forest. Stream moss-banked indicating lack of flooding, 1-2 feet wide, pools to 2 feet deep. See P. elongatus for weather. 0930 hrs.

425 ft.
26 July Calif.: Marin Co., 1½ mi. E San Geronimo, San Geronimo Creek, A

Adult ♀ frightened off rocky gravel bank in stream-bed and into water. 1245 hrs. air 20 3/4°, water 15¼°C. Stream with small shallow pools of quiet water often connected by small trickles of surface water. Pools about 6 to 10 feet long, 2 to 3 feet wide, 3 to 6 inches deep. Some considerably larger. Water clear, bottom clean except for Umbellularia leaves which occur singly and scattered or in local mats. Weather: clear, sunny, cool with broken high cloudy overcast. Water striders very abundant — about 1 per square foot of water surface.

Large adult ♀ frightened from rocky-gravel stream-

W. Reiner
1952

Rana boylii

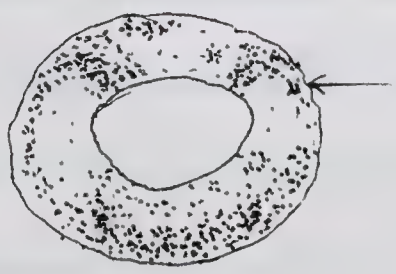
26 July Calif.: Marin Co, 1½ mi. E San Geronimo, San Geronimo Creek, 425 feet A
bed into shallow quiet pool 2 inches deep. Air
21½°, water 16¼° C 1410 hrs. Also see T. granulosus
account. Thin overcast – no shadows.

W. Riemer
1949

Rana pipiens

24 June Utah, Salt Lake Co., 1.5 mi. E. Murray #151, taken at edge of stream of fish hatchery in water cress. Flow of considerable speed. Water temp. 20.4°C. Jumped in but soon returned to shore. Associated animals in area: Thamnophis ~~elegans~~ ~~sirtalis~~.

25 June Utah, Summit Co., 13.6 mi. NNW Heber #155, taken in stand of dark green sedge about 2 ft. high on peninsula in large swampy area. Appears to have been hiding among matted dead sedges on ground and disturbed from under foot. Was not able to attain water for escape but jumped rapidly and viradically about through sedges. Coloration as follows: Ground color yellowish - light green with brownish suffusion except immediately bordering dark, brownish black dorsal spots. Here suffusion lacking. Dorso-lateral folds light golden brown. Venter uniformly buffy white except ventral to angle of jaw where small irregular patches of buffy brown. Eye:



rt. eye ant. →

W. Riemer
1949

Rana pipiens

27 June Utah, Utah Co., shore Utah Lake, 1 mi. W Provo. Common and occupying some habitat Pseudacris nigrita (see that account this date) though not so closely restricted to grassy areas. Very rapid jumper heading in bee line for cover. Many half grown. 1 taken 200 ft. from shore in 2' ft in shade of tree. Tired out by chasing. 6' jumps perhaps 15 in number left animal in condition which permitted picking up without attempt at escape.

11 July Calif., Imperial Co., 0.6 mi. W S W Imperial Diversion Dam Small series of young, adult, and tadpoles taken in cattail marsh after dark. # 262, colors in life, young, dorsal ground color blue-green with heavy red gold suffusion. Dorsal spots reddish gold with black ~~spot~~ periphery. Venter white with hind legs transparent to middle of thigh. Light mottling of throat. Dorso-lateral fold gold. Iris ~~copper~~.
263, young, colors in life. Dorsal spotting not apparent. Dorsum olive drab with heavy copper suffusion. Dorso-lateral fold silver green to green gold. Hind limbs largely transparent appearing. Venter white with mottling on throat. Iris copper.

W. Reimer
1949

Rana pipiens

15 July Arizona, Santa Cruz Co., 4.0 mi. NNW Nogales
Series of 9 animals, all immature except one taken in "mud tank" pool on cattle ranch. Pool shallow at least near edges, 6 - 10" deep. Water clear but much floating debris, leaves, small twigs etc. on surface near shore. Often frogs spotted by head only projecting through this debris. Grass along edges and in shallowest water of edges. Frogs mostly hidden in this grass and often would not jump into water until actually stepped on. Very difficult to spot frogs until they jump.

16 July Arizona, Santa Cruz Co., Peña Blanca Springs
315, colors in life; dorsal ground color blue-gray with copper suffusion. Dorso-lateral folds gold. Yellowish laterally on both sides of thigh. Green-yellow patch between eye and nostril but below both. Scattered parasites(?) on venter. Appear same as those on venter of H. arenicolor. Taken on damp soil at seep just outside camp ground at ± 2200 hours.

17 July Arizona, Santa Cruz Co., 2 mi. W Peña Blanca Springs
Several taken from cattle tank after dark along with many Microhyla. Lightening strongly.

W. Riemer
1949

Rana pipiens

21 July — Arizona, Cochise Co., Fort Huachuca

Chorus of animals calling from pond in officers area of post headquarters at night. Pond result of artificial dam. Many cattails near margins, cottonwoods, banks grass covered. Most calling from amongst (?) cattails and few if any from shore. See R. Stebbins notes for details of call and my version of calling behavior, posture, appearance of sacs.

29 July — Arizona, Navajo Co., 0.8 mi. NNW Lakeside, State Hwy 173

Species abundant in the various pools and irrigation channels around Lake O' the Woods Lodge. Most commonly resting at edge of water and jump in when disturbed. Noted that when cover in form of grass at edge of water is dense and tall frogs most often do not jump in until almost stepped on. Those on bank when grass short or thin jump when approached within 20–30 ft. most often. Few Pseudacris nigrita present in one certain spot

18 Aug. — Colorado, El Paso Co., 4.3 mi. SE Colorado Springs, U.S. Hwy 85-87

Young specimen taken at edge of Creek in moderate flow of water. Jumped in on approach from edge of bank and swam

W. Riemer
1949

Rana pipiens

18 Aug. Colorado, El Paso Co., 4.3 mi. SE Colorado Springs, U.S. Hwy 85-87 upstream about 6 feet angling back to edge of water where flow least strong and took shelter under small mass of scum clinging to exposed roots. Banks bare and of course sand. Perhaps frog had been hiding under portion of old rusted drum. Stream - intersected by several sand bars - about 75 ft. wide with channel of rapid flow near center. Willows and cottonwoods short distance from bank. Temp. of water at site of capture 24.6° C, 1115 hours.
#463, juvenile, colors in life; venter white with pale gold sheen in light at sharp angle. Under surface hind legs pale yellow. Dorsal ground color ≠ brown - olive - gray. Brown dominent throughout except immediately surrounding blotches where gray dominent. Blotches golden yellowish-green often with ridge running in long axis of body bisecting blotch and of golden brown color at crest. Dorsolaterally fold and supralabial fold very pale greenish - yellow gold. Concealed portions of hind limb especially posterior side of thigh and groin yellowish - green. For iris see next page.

W. Riemer
1949

Rana pipiens

18 Aug. Colorado, El Paso Co., 4.3 mi. SE Colorado Springs, U.S. Hwy 85-87

463

reddish gold.
rt. eye
ant. →

W. Riemer
1950

Rana pipiens

18 Mar. Mexico ; Durango : 3 mi. SW El Salto, 8400 ft±

In evening took one small specimen. Others present and seen. First noticed animal as result of very weak short croak. Imitation of call resulting in further response but all responses weak. Is this because of coolness of night or earliness of season? Also animals tended to remain in secluded spots under rocks, etc. rather than sit in open at edge of water as is customary in breeding season. See also journal of 4 Mar. in reference to this species.

20 Mar. Mexico: Aguascalientes : 10 mi. N Aguascalientes

Took two large specimens in stream under bridge under highway. Many calling with almost chorus effect though not continuously and without rhythm. Is this activity the product of warmer weather at this lower elevation? Are the seasons more advanced here than at El Salto locality - see above? Though animals distributed for several hundred feet along stream calling regularly only under bridge. Why? Stream flanked by cultivated fields but along edges of water shrubs and trees (cottonwoods?) largely undisturbed. Water still and cloudy but deep. Stream obviously permanently with water in considerable quantity all year. About 25 ft. wide.

W. Riemer
1950

Rana pipiens

9 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose

755, color of dorsum brownish olive, with brown spots, pale green suffusion about head and neck. Dorsolateral stripe pale gold. Iris gold. Venter white with pale gray mottling on gular

756, color of dorsum pale olive with strong gold suffusion, blotches green olive with gold suffusion. Dorsolateral stripe, iris, venter as above. Hind legs greenish-yellow suffusion.

These two animals taken at edge of small ponds in sink areas in open pine forest close to camp. Such ponds margined by grass, the ground being well chopped up by livestock. One was taken under small piece of wood near water, the other in a hoof print depression. Taken during daytime.

10 Apr. Three pipiens and another sort of ranid (# 765) all taken together under one very small piece of wood 30 feet from water on grassy bank. Water consists of muddy pool 100 ft. across in opening in pine forest. Surrounding ground well trampled by livestock. Taken in daytime. A fourth pipiens (# 763) taken under piece of wood in open grassy area 100 yds or more from a lake near Montebello. Taken because it appeared different from other local pipiens.

12 Apr. After dark collected with Koford five R. pipiens

W. Reimer
1950

Rana pipiens

12 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose.
each showing a different degree of spotting but all from a small stream flowing into the largest of the lakes in this region. All taken in water or on grassy bank at edge of water within total distance of 300 ft. The majority of specimens seen had spots approaching the typical pipiens pattern, many had reduced spots and not infrequently no spots at all. The series of five are a selected sample.

W. Riemer
1953

Rana pipiens

29 June Mexico: Chihuahua: 7 mi. SW El Vergel (=Laguinita), 7800 ft.:
Common. Appears to be only Rana present. Several egg masses noted in shallow (1 inch - 2 inches) of water in quiet side pools of stream. Masses 3-4 inches in diameter, flacid, unattached, silty. About ⅓ of those seen with hatching larvae.

W. Riemer
1949

Rana sylvatica

23 Aug. Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Pk., State Hwy 14

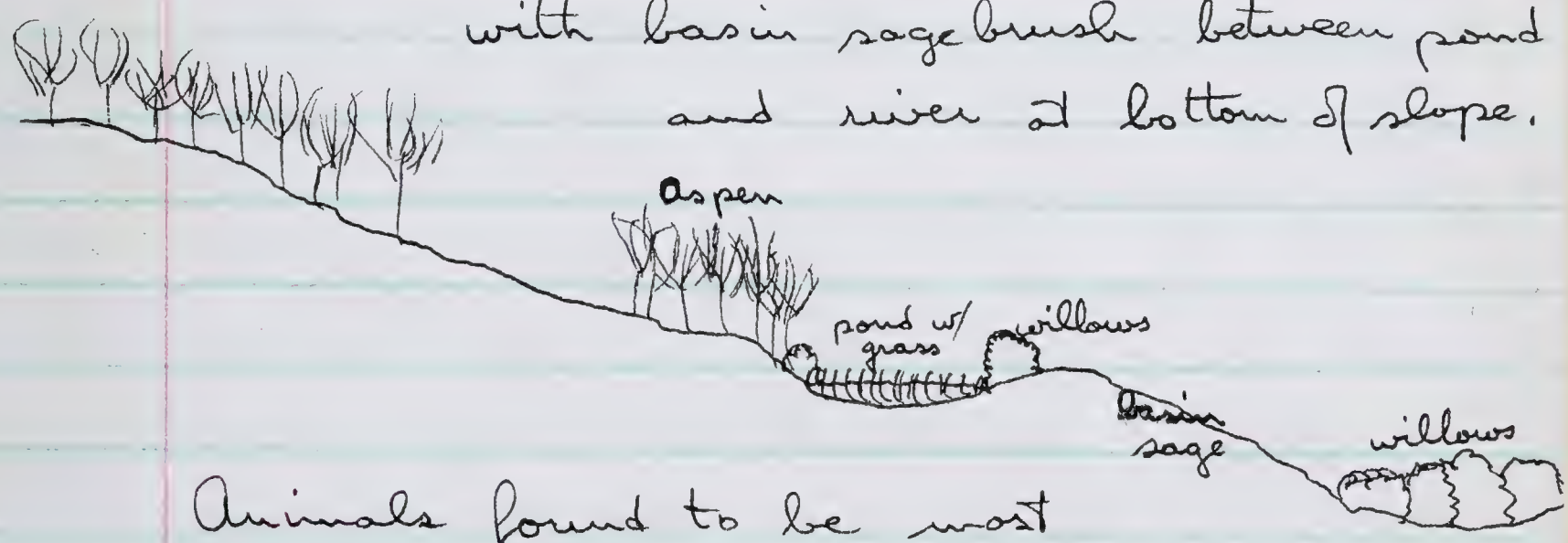
Adult taken 0915 hours in tiny rivulet at edge of but within aspen grove. Dense grass and herbaceous annuals to 24 in or more. Rivulet well choked and overgrown with such green growth. 50 ft. upstream from dense scrub willow thicket. Rivulet scarcely flowing from 6-12 in. wide, less than 1 in deep. V-channel in which stream flows about 25-50 ft. deep with gentle to moderate slope to sides. Weather clear and sunny. Animal may have been sunning when disturbed. Ground covered rather uniformly with sun and shade mottling. When first spotted animal had left from sunniest bank into stream and onto other bank. Clapping net over spot apparently failed to stop him. Search of vegetation revealed nothing; the animal did not sit tight as claimed by Maslin. Finally a trampling of vegetation induced him to jump back to stream from 4-5 ft. up bank. Jumps not nearly so long and continued as R. pipiens.

W. Reiner
1949

Rana sylvatic

23 Aug. Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Pk., State Hwy 14.

In small pond completely overgrown with coarse, 24-36 in. grass and surrounded by scrub willows and with aspen on two sides found newly metamorphosed young abundant. Equally abundant were young Pseudacris however no R. pipiens were about. Pool at lower end of aspen grove in hollow spot on hillside with basin sagebrush between pond and river at bottom of slope.



Animals found to be most abundant on grass where well trampled by sheep at edges of pool and hence lying prostrate and exposed to sun but yet very damp. Also abundant where grass thin enough to permit sun to reach soggy soil at edge of water. Also abundant in grass, well trampled, among aspens and beyond willows where such grass or soil damp. Also abundant in small spot at edge of willows where soil largely bare and dry on surface but first well loosened

W. Riemer
1949

23 Aug.

Rana sylvatica

Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Pk., State Hwy 14. by rodent burrow tailing and then punched into cavities by sheep ~~hoofs~~ hooves. Such holes damp in bottom as was all soil below surface and most often with a little ~~tangled~~ grass in bottom. In such cavities young frogs hid. In all spots favored frogs could be exposed to sun and yet remain moist without moving more than a few inches if at all. Only a few taken in dense grass and none seen in dry areas of sage beyond willows or in dry soil of aspen grove though green grass abundant there. Frogs present at least during hours of 1000-1200 and probably all during day. Large number of both forms taken.

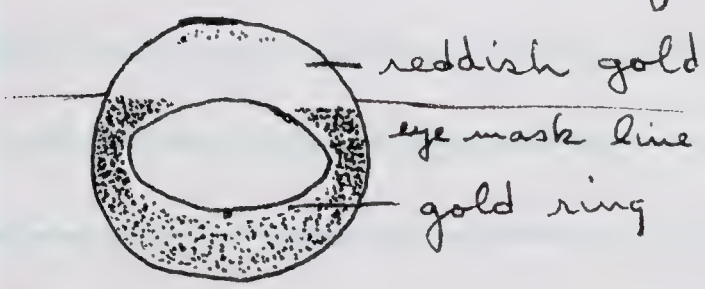
#481, adult, colors in life; venter milk color with mottling of faint olive brown on chin region and throat. Vertebral stripe golden-cream. Stripe margined with black. Next lateral is olive gold area also longitudinal with ridges of copper centrally on back. Next lateral is stripe of grayish buff. Next lateral is dorso-lateral fold, copper medially and black or black brown laterally. Lateral to fold is area of

W. Riemer
1949

Rana sylvatica

23 Aug. Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Peak, State Hwy 14

lavender gray with spots & cream and black. Grades in mottled manner into ventral color. Hind legs copper dorsally with silvery cream stripe on dorso-posterior surface, especially prominent on lower limb. Ventral and posterior to light stripe are 3 or more dark brown or blackish spots on lower limb. Anteriorly on limb copper changes to golden cream. (Note: Orient hind-limb at right angles to body and outstretched for above relations to hold.) Eye mask coffee brown and spot on anterior and ventral surface of forelimb at insertion same color with purple tinge. Ventral to eye mask, stripe & greenish silver. Iris of reddish gold.



#482, young, recently metamorphosed, description of about two dozen, colors in life; venter cream with gold tinge. Vertebral stripe cream gold and margined by broad stripe of from golden olive to

W. Reimer
1949

Rana sylvatica

23 Aug. Colorado, Jackson Co., 5 mi. ESE Rabbit Ears Peak, State Hwy 14

olive brown to golden brown. Golden olive is the commonest. All show a distinct vertebral stripe. Just medial to dorso-lateral fold is stripe ♂ from golden gray to golden buff, the latter the most common. Dorso-lateral fold medially same color as stripe just described but often with more gold in evidence. Lateral side ♂ fold usually with blackish but such color broken and irregular. Laterally a gray gold or gray buff area with black specks. Eye mark with margin dorsally and posteriorly ♂ deep brown or black but ventrally has area ♂ green-gold, brown, or olive gold. Ventrally still further is light stripe ♂ silvery or gold with tinges ♂ from orange (pale) to green (pale). Irises gold.

W. Riemer
1949

Rana tarahumarae

18 July Arizona, Santa Cruz Co. Sycamore Canyon, 1/2 mi. SW Yanks Spring.
Several taken in deep pool also inhabited by Rana pipiens. In habits react similar to pipiens but at least in so cases grow to larger size. Very similar in appearance to R. boylii of coast. Large numbers of large tadpoles (unidentified) in algae at bottom of pool. Fish in considerable numbers present. Also Kinosternon seen to enter pool.

W. Riemer
1953

Scaphiopus sp.

26 June Mexico: Chihuahua: 9 mi. ESE La Junta, 70 mi. WSW Chihuahua Series of larvae netted in pale muddy water of pools in transient(?) drainage. Larvae extremely light dorsally. Seemed to stay in deeper water. Ostracods, anostracans (like Artemia only 1–1½ inches long), water beetles also present.

W. Riemer
1949

Scaphiopus couchii

23 July Arizona, Cochise Co., 10.5 mi. NNE Douglas, U.S. Hwy 80

Animal taken while floating in shallow water 3 ft. from edge of water in rain pond. Mesquite desert. Located by call, a ventriloquistic nasal non-pulsating baa-ing. Imitated by calling like a sheep while holding nose tightly closed and forcing metallic tone. When calling lying in water, out stretched limbs, sac expanded above water though possibly in contact with same. Effort involved appeared considerable and when sac fully extended back bend sharply backward almost submerging animal except for head and sac. Is this result of buoyancy of sac? Easily taken by hand when blinded by flashlight. Voice appears to be coming from each bush or tuft of grass that lies between animal and observer as he approaches even though animal 100 or more feet away. Ventriloquistic quality operates then in straight line only rather than appearing to stem from various sectors around observer.

370, adult, colors in life; venter milk, dorsum a yellowish green with very fine

W. Riemer
1949

Scaphiopus couchii

23 July Arizona, Cochise Co., 10.5 mi. NNE Douglas, U.S. Hwy 80.
(#370 cont'd)
speckling of black concentrated to small black spots on tops of some tubercles. Nuptial pads velvety black. Upper margin nictitating membrane with lemon yellow border. Iris greenish gold.

rd. eye
and. →

W. Riemer
1949

Scaphiopus hammondii

22 June Nevada, Nye Co., Currant
Larvae of two sizes taken along stream margin. Large specimens in very shallow algae free water. Smaller specimens in shallow water with thick mass of green algae over large part of pool. Eggs taken attached to submerged leaf of a sawgrass in shallow water close to site of large tadpoles.

17 July Arizona, Santa Cruz Co., Peña Blanca Springs
Two taken on roadway just after dark. Spotted as hopping across road in headlights on dirt road. Had rained heavily during afternoon.

22 July Arizona, Cochise Co., Fort Huachuca
#360, colors in life, adult, dorsal ground color creamy gray, tubercles of dorsum especially posteriorly tipped with red-orange. Dark spots about tubercles greenish sooty-Venter white. Ventral surface hind feet transparent purple-pink. ~~Iris gold~~.

gold with slight green tint

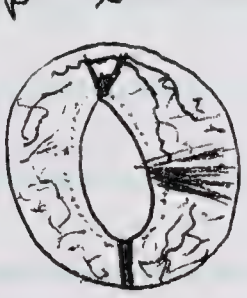
Rt. eye and →

W. Riemer
1949

Scaphiopus hammondii

23 July Arizona, Cochise Co., 2 mi. NNE Douglas, U.S. Hwy 80

Single specimen taken on road at night (2200) near roadside puddle in which B. insidior and B. cognatus calling. No ~~scaphs~~ scaphs heard or seen except in hand. this one. Gives off oder like hot popcorn when held. #367, colors in life, adult; venter milk, dorsal ground color olive on head and anterior half of back, gray added laterally and posteriorly, tubercles red tipped especially on posterior half back. Dark spots of dorsum deep brown. Iris gold.



rt. eye
ant. →

24 July Arizona, Graham Co., 16.4 mi. NW Pima, U.S. Hwy 70

One individual of many taken while calling in artificial pond at side of road. Also present in pond and calling were B. insidior, cognatus, woodhousii. Call, a low, slow, outboard motor. Imitated by drawing air in over relaxed vocal cords.

#374, adult ♂, colors in life, venter milky white, dorsum gray with greenish gold, blotches olive brown, tubercles in posterior-most blotches tipped with old rose. Nuptial pads dark velvet brown. Iris gold.

W. Riemer
1949

Scaphiopus hammondii

10 Aug. New Mexico, De Baca Co., 9 mi. E Fort Sumner

17 specimens taken mostly on road but some on shoulder and in adjacent field. All young and 1 in. or less S-V length. Taken at same time was one very small Bufo insidior and one large S. bombifrons Had rained recently as evidenced by damp road shoulder and also Red Lake (not examined) with 1/4 mile. Anurans seemed concentrated on road in this area.

Six Scaphiopus taken at one time in area with radius of 4 ft. B. insidior and one hammondii taken at 1810 hours when still bright. Others taken about 2030 - 2100. Large numbers crushed on pavement.

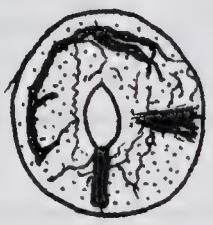
Colors on living specimens. Venters milky white with tinge of bluish. Dorsal ground color pinkish buff ①, olive ①, sooty gray ①, tan to gray with olive ⑭. Size, number and arrangement of tubercles on dorsum highly variable but all specimens with orange-red to vermillion on tubercles. Such patches of color surrounded by areas of olive (dark) to black ~~all~~ also variable in size. Each with small spot of color, deep yellow to orange, on each side of vent except pinkish-buff animal;

W. Reiner
1949

Scaphiopus hammondii

10 Aug. New Mexico, De Baca Co., 9 mi. E Fort Sumner

which has deep cream color spots. Several animals with similar spot of color just below knee on dorsal surface hind leg. Others with or without usual red of tubercles at this point. Irises vary from yellow to reddish gold and with rather uniform amount of melanin network. Two with slightly heavier network. Variation as to which most prominent the black vertical bar beneath the pupil or the horizontal bar anterior to the pupil. One animal with eye almost completely black with melanin. Drawing of iris a composite, but typical of all.



rd. eye
ant. →

Riemer, W. J.

Species Accounts

1947-1954

Reptiles:

Turtles

Lizards

Snakes

Turtles

J. Riemer
1948

Clemmys marmorata

10 Apr. Wildcat Canyon, Tilden Park, Contra Costa Co., Calif. Cr.

On log, one individual, Jewel Lake.

9 May Etcheverra Creek, 2 mi SE Knoxville, Napa Co., Calif. Large number of turtles in this area. Often three to five in sight in water at one time. Stream shallow (8-10 inches). Bottom bare rock in more rapid spots, gravelly in pools, muddy near banks. Many small fish in water. One specimen taken. Similar appearing spot five miles further downstream showed not a single individual in 1½ hours search.

flow

is

th

W. Reiner
1951

Clemmys marmorata

1 mi. W, ½ mi N

18 Aug. Calif.: Sonoma Co., Skaggs Springs, Warm Springs Cr.

This species common under algal mats in sun at edge of stream. Appear to congregate in such places in shallow water. Carapace at surface of water. This suggests that turtles are seeking warmth of sun and also protection of mat.

W. Riemer
1953

Kinosternon

25 June Mexico: Chihuahua : Rio Papigochic, Miñaca, 6300 ft.

Two, one adult, one young taken in water-weed ~~shoebot~~ choked margin of main stream. Both taken accidently while sweeping for tadpoles.

W. Riemer
1949

Terrapene ornata

10 Aug New Mexico, Curry Co., 2.9 mi. E Melrose, U.S. Hwy 60 and 84 Single specimen taken alive at edge of pavement in late afternoon (1715). Body temperature, 30.6° C. Weather cool and overcast. Large numbers of animals DOR, some very freshly killed. None very young! Dead rather evenly spaced ¼ - ½ mile apart from Clovis to well W of Melrose. Do they constantly get killed crossing the road or is this slaughter the result of a seasonal movement of some sort? Are they responding to the weather? Certainly they must be abundant in this area.

427, adult, colors in life, plastron with brown to light brown markings on greyish-mustard yellow ground. On carapace brown markings darker being deep brown to sooty brown on same ground. Free margins of marginals transparent horny yellowish. Orange-salmon on some of light scales of ~~feet~~ fore feet. Further analysis difficult in living animal.

11 Aug. New Mexico, Socorro Co., 6.4 mi. E Bernardo, U.S. Hwy 60

1830 hours took L.O.R. specimen. Short-grass, yucca, Russian thistle along road. Overcast and raining during afternoon.

W. Riemer
1949

Terrapene ornata

11 Aug. New Mexico, Socorro Co., 6.4 mi. E Bernardo, U.S. Hwy 60 Not yet dark though sun well hidden behind heavy clouds. ~~Carapace~~
445, adult, colors in life; carapace blackish brown with mustard yellow marks. Plastron same except colors at least medially less intense. Bright salmon on some scales of fore limbs. Top of head yellow-green-olive. Snout below nostrils and lower jaw deep blue gray. Iris deep rose red.

19 Aug Colorado, Weld Co., vicinity Roggen, U.S. Hwy 6
Two specimens taken h.o.r. at about 1800 hours. One DOR also seen. Grain stubble fields on one side of road, grass, Russian thistle and sunflowers along tracks on other side. No trees about.
464, adult, colors in life; carapace same as #445; plastron same except medially brown is largely lacking blackish. Light marks are cream ventrally. Top of head mottled brown and black, lower jaw dirty milk. Milk to brown on scales of forelimbs but no salmon. Iris rich chocolate brown with central and peripheral

W. Riemer
1949

Terrapene ornata

19 Aug. Colorado, Weld Co., vicinity Roggen, U.S. Hwy 6

margins of gold flecks, much more prominent on periphery. Peripheral to iris is greenish yellow area of eye (sclera?)

465, juvenile, colors in life; shell same as in 464 except ventral medial brown not particularly light. Top of head mottled tan and brown, lower jaw yellow with green tinge. Forelimbs with scales of cream to brown. Iris blotched reddish brown centrally and irregularly but otherwise pinkish orange gold. Peripheral to iris yellow green area as in #464. Body temp. 29.8°C

20 Aug. Colorado, Weld Co., 5 mi. WSW Wiggins (in Morgan Co.)

Specimen taken 0910 hours on top of sand hill. Grass and yucca (18 in.). Very strong wind blowing, cool, sunny. Sand damp from last nights rain. Others also seen at this time of morning but none shortly afterward. 0920 one seen near crest of sand ridge. Not captured. Sunflowers, prickly pear, grasses, Artemsia. Weather same as above.

W. Reiner
1949

Terrapene ornata

20 Aug. Colorado, Weld Co., 5mi. WSW Wiggins (in Morgan Co.)

#469, adult, colors in life; carapace and plastron as in above specimens except dorsal yellow more brilliant and ventral yellow deep cream. No salmon ~~of~~ on forelimbs — only scales cream to yellow orange to brown. Top of head mottled tan to brown with mustard yellow specks. Snout from just above nostrils to and including lower jaw cream with greenish tinge. Iris ~~pale g~~ chocolate brown with extensive invasion of pale gold obscuring all but central portion of chocolate. Area peripheral to iris yellow-green with salmon tinge anteroventrally.

Lizards

W. Reimer
1953

Anolis sp.

12 July Mexico: Sinaloa: 10 mi. by road NE El Batel, 6400 ft.
#2107, single adult ♂ taken from small bush on hillside. Dorsum grey-tan, dewlap bright orange with red stripes between rows of white scales.

W. Riemer
1950

Anolis

27 Mar. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.
Specimen taken at entrance to camp tent running across pine oak leaf litter in open forest situation, 1100 hrs. Two more taken by Pitelka under similar conditions.

10 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose
766, color of dorsum grayish tan medially, rusty tan laterally, milk on venter. Gular fan scales white, skin chrome yellow, vermillion and deep brick red streaks. First seen on projection on fallen log in sun. When approached jumped two ft. into 6-8 in. ground cover to escape. Another specimen in vicinity (not taken) perched on horizontal log in semi-shade. When approached jumped and ran through tangle of ground cover. Species seems capable of leaping at least one foot even upward. Another specimen taken on small burnt section of tree trunk in semi-shade. Body temp. 28.3 °C. This taken by hand though usually too wary to noose even.

13 Apr. Specimen brought in by native. Taken on roadway near camp. Pine forest with jungle growth of stream-bed nearby. Said by a native to live in large oaks. # 783, color of dorsum light green and sooty brown irregularly mottled. Dewlap light green and pale old rose indistinctly streaked.

W. Reiner
1950

Anolis

20 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose

Two specimens shot today. Both taken at edge of trail (providing a small open sunny area) at edge of jungle. Species tends to prefer apparently places where there is present a fairly dense low growth into which it can escape and also one providing semi-shaded spots in which to sun. ~~It~~ does not appear to be present in dense jungle growth nor in open parkland type woods.

1 May Mexico: Guerrero: 3 mi. W Omiltemi, 8200 ft.

#875, dorsally a brownish vertebral stripe, rest tannish gray. Venter milk with faint yellow suffusion. Gular dewlap small, scales milk, skin old rose. Iris black except of light ring of gold around pupil. Taken in dry pine-oak leaf litter on ridge in camp. Semi-open forest.

W. Riemer
1950

28 Apr. Mexico: Guerrero: 3 mi. W Omiltemi, 8200 ft.
#847, color of dorsum white and very deep sooty brown, almost black. Venter white with gray-brown indistinct mottling, chin entirely white. Medial yellow-orange area extending forward from vent third of trunk length and fading anteriorly to weak yellow. Same orange bordering upper edge of infralabials. Soles yellowish. Iris very pale gold. Pupil irregularly round. Taken in camp tent crawling over leaf litter. First detected by rustling of dry leaves. On top of ridge, pine-oak mixed forest. Soil dry and dusty. Full shade, about 0800 hrs.
#848, color of dorsum milk and olive-brown the latter much the most dominant. Venter milk with heavy suffusion of grayish. For half inch anterior of vent, scales almost completely rusty orange medially, the orange occurring only along posterior margin of ventral medial scales forward to gular area where orange more nearly yellow. Soles yellowish. Orange also present on upper margin of infralabials. Iris pale gold, pupil irregularly round. Taken in late afternoon while walking under a log lying in dusty road. Full shade. Mixed pine-oak forest. Steep adjacent slopes.

30 Apr. Mexico: Guerrero: Omiltemi, 7500 ft.± Found dead on road and obviously killed by a native. In canyon bottom in dense broadleaf forest. Steep slopes. Near stream.

W. Riemer
1950

30 Apr. Mexico: Guerrero: Omiltemi, 7500 ft. Above white, black, and brownish gray. Entire under surface rusty orange except anterior-most portion of chin. No sign of rusty on infralabials.

W. Riemer
1949

Callisaurus draconoides

13 July Ariz, Maricopa Co., 6.9 mi. W SW Gila Bend
One animal shot 0800. Body temperature 40.0° C. Taken in area of very sparse, scattered, dwarf creosote. Extremely wary though because of sparse vegetation easy to follow. This animal ran about 400 ft. before I could approach close enough to get good shot. This is presumably area in which gabbii and ventralis intergrade. None were seen in mesquite belt described under this date under Cnemidophorus tesselatus.
#264, animal described above, colored as follows 2½ hours after death. Abdominal patches blue-green grading rapidly to lemon yellow in groin and gray-salmon just posterior and ventral to axilla. Yellow also on ventro-lateral surface swollen portion tail, on anterior surface thigh, as suffusion on dorsal surface trunk at level hind limb insertions. Suffusion grades antero-ventrally to orange then salmon just posterior insertion fore-limbs on dorsum. Yellowish suffusion persists in vertebral line. General color of midline center of back a gold gray. Throat ashy-white-gray.

W. Riemer
1949

Callisaurus draconoides

14 July — Arizona, Pima Co., 36 mi. WSW Escuela, ~~#~~ State Hwy 86
Single specimen shot while resting beneath mesquite shrub. ~~Bdt~~ Body temp. 42.6°C at 1715 hours when taken. Others seen in vicinity but not so abundant (or more wary) than Holbrookia. See that species for account of plants in area. Associated forms also under Holbrookia this date. # 275, colored after 16 hours death. Abdominal patches salmon anteriorly, blue (dark powder), lemon yellow. Gular area gray with gray salmon spot just anterior anterior gular fold. Yellow suffusion over posterior half dorsal side trunk, upper and lateral surfaces base of tail, upper segment hind limbs. Light orange suffusion dorso-lateral surface anterior half trunk. Broad, milk, vertebral stripe with no distinct boundaries. Upper segment forelimb pale yellow with pale orange on upper surface proximally. (4877 ft.)

27 July — Arizona, Yavapai Co., 1 mi. SW Yarnell, U.S. Hwy 89
Single individual shot at 1330 hours on weathered granite hillside. Much rock, chaparral thin. Body temp. 42.4°C. Wary.

W. Reiner
1949

Cnemidophorus gularis

14 July Arizona, Pima Co., 36.0 mi. W S W Ecuela, State Hwy 86 Single animal taken amongst bases of prickly pear. 1755 hours, 40.0° C. See Holbrookia maculata for plants and animals associated; and Cnemidophorus tesselatus for ecological segregation notes. #282, colors after 17 hours dead; venter essentially white, top of head yellow-olive, dorsal longitudinal stripes pale lemon yellow behind head grading to whitish anterior to base of tail, copper spots or segments of stripes within black-brown longitudinal stripes. Suffusion pale salmon over hind limbs especially distal segment and foot.

16 July Arizona, Santa Cruz Co., Peña Blanca Springs 3 specimens taken, all shot. Mossing proved very difficult and time consuming. Extremely common, occurring both of flat gravelly bottoms of surrounding washes and on rocky gravelly slopes. Body temperatures 39.8°, 41.0°, 41.2° C. Noted to be feeding at almost noon in hottest sun as well as shade. Tend very definitely to stay in shade of plants or in semishade seldom stopping long in direct sun. Probably forage throughout day. Vast numbers of very young green and brown grasshoppers about. As this major form

W. Reiner
1949

Cnemidophorus gularis

16 July Arizona, Santa Cruz Co., Peña Blanca Springs

Sf food at present? No tesselatus seen in this area. Perhaps locality is to high for tesselatus, about 4000.

#295, colors in death (4 hours); medial stripes just behind head black and lemon yellow grading to brown and tan above hind limbs. Lateral stripes grayish-white on trunk. Top of head olive. Buff over hind limbs except ventrally and on feet and lower forearm. Buff laterally on tail fading ventrally.

#296, colors after 4 hours death; medial stripes just behind head brown and yellow, becoming lost in general tan suffusion anterior to base of tail. Lateral stripes become gray-white. Much black in stripes at midbody. Top of head olive with red tint. All of tail and hind limbs with strong rust suffusion except ventrally. Forelimbs with touch of buff. Touch of lavender-salmon on lateral-most row of ventrals between limbs.

#297, colors after 4 hours of death; same as #295 except black of dorsum merely deep brown and yellow with bit of orange. Proximal one-third of tail yellow-tan.

W. Riemer
1949

Cnemidophorus gularis

18 July — Arizona, Santa Cruz Co., Sycamore Canyon, ¼ mi. SW Yanks Spring. 3 specimens shot just after midday while foraging(?) in open canyon bottom. Body temp. 40.6°, 38.8°, 40.6° C. Two were taken on flat floor of canyon in rocky area with sparse grass and partially shaded by trees. Thin litter of leaves and wood on ground. One taken on large rock at edge of canyon floor. Animal at time traversing 45° slope on rock. Impressed by fact that this species much more of a rock dweller than tesselatus. Have noticed it repeatedly about buildings in town (Nogales) and even on ~~the~~ concrete loading platforms and in alleyways in center of town.

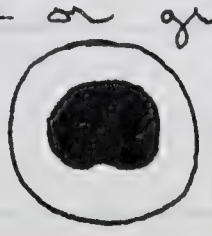
29 July — Arizona, Navajo Co., 5 mi. S Holbrook, State Hwy 77. Single animal seen and shot on formation of sandstone (?) in thin strata which were "wildly" tilted. Largely barren of vegetation; juniper (dwarfed), thin grass clumps, scattered annuals. Fractured bedding planes provide numerous retreats for lizards. Formation not extensive and population probably denser beyond periphery. Surrounding terrain flat. Body temp. 1430 hours, 40.8° C.

W. Rieman
1949

Cnemidophorus gularis

1 Aug. New Mexico, Grant(?) Co., 1 mi. above X S X Ranch, E. Fork Gila River Single specimen seen and shot on earthen retaining wall of artificial fish pond. On floor of canyon near river. Cover of annuals on retaining wall. Weather intermittently sunny and overcast. R. pipiens abundant in pond and stream.

6 Aug. New Mexico, Otero Co., Alamogordo Single specimen shot in mesquite - Atriplex association W of town ¼ - ½ mi. C. perplexus in same habitat one being shot about 20 ft. away. Population apparently sparse, ground appeared to have been shallowly flooded since surface crusted and cracked. Warm, sunny. ~~Entire ventral~~ #419, adult, colors 2 hours after death; entire ventral surface silvery gray white except gular which is without silver hue. Dorsal ground color tan to light brown with cream to butter yellow spots between longitudinal stripes and on both segments of hind limbs. Stripes a gray buff. Top of head olive brown. Tail dorsally gray brown with touch of blue or greenish distally. Iris pale cream



W. Riemer
1949

Cnemidophorus perplexus

6 Aug. New Mexico, Otero Co., Alamogordo
Two specimens taken W of town in mesquite–Atriplex association along with C. gularis. See that account this date for details of habitat.
420, adult, colors 3 hours after death; ventral surface pinkish white on body with faintest suggestion of blue especially at scale sutures. Entire gular and throat with pale blue wash almost silvery-blue. Tail at base, ventrally, same as body but 1 in. from base grades rapidly to dark greenish blue grading to purplish-blue near tip. Dorsal stripes deep cream, ground color blackish brown. Top of head light brownish with blue suffusion near snout. Light portions side of face gray-blue. Dorsal portion lower hind limb segment with reddish hue though foot and especially toes washed with blue. Tail to 1½" from base purplish-brown grading rapidly to blue to tip. Iris bluish-cream

rt. eye ant. →

W. Riemer
1953

Cnemidophorus sacki

6 July — Mexico: Durango: Rio Nagas at San Salvador

Series of three adults taken along river bank on sandy soil among cottonwoods.
Colors in life: Deep blue ventrally on trunk ~~ranging~~ ranging from black in pectoral region to deep blue or whitish in pelvic region. Under side of tail white to pale blue. Throat to gular fold, rusty red except large labial series. Throat color sharply delimited by gular fold, ventral blue sharply delimited at edge of ventral scutes. Under side of limbs also blue. Dorsally, posterior portion of trunk black with spots of rust at mid body grading to lemon yellow at base of tail. Tail grayish green. Top of head olive grey. Face light grey with bluish tinge.

6 July — Mexico: Durango: Rio Florido at Canutillo, 6100 ft.

Single adult taken among cottonwoods along river. Colors #2020 freshly killed: Venter white with salmon pink laterally on gular and also on distal, regenerated one-half of tail. Dorsum black with ~~rufous~~ brown spots posteriorly. Stripes pale lemon anteriorly grading to deep buff at pelvis. Salmon-pink extends onto posterior surface of thighs and laterally on tail.

W. Reiner
1949

Cnemidophorus tesselatus

27 June — Utah, Juab Co., 13.4 mi. S. Eureka
Common. Several taken with following body temp. 40.2, 38.4, 39.0 °C. Juniper, basin sage-brush. Soil gravelly to rocky. Seek shelter of shrubs and trees. Species present in wash as well as on slopes. Patches of grass sparse but other-wise soil barren of small growth. Junipers confined to slopes. One animal roosed. Had just dug with forefeet in needle litter and extracted a grub(?). Weather hot and sunny. Associated animals: Uta stansburiana and Pituophis catenifer.

174, freshly killed, yellowish tan in dorsal longitudinal stripes grading to white laterally near ventral plates. Very faint suggestion of old-rose on central gular scales.

175 same as 174 when freshly killed

176 same as 174 except lacks color on gular area.

4 July — Utah, Washington Co., Bloomington 1 specimen about large, dead, fallen cottonwood stump with thickly piled dead branches about. Surrounding ground open. Associated with Uta stansburiana and S. magister

W. Reiner
1949

Cnemidophorus tessellatus

9 July — California, San Bernardino Co., 4.1 mi. N Riverside Co. line at U.S. Hwy 95. Single animal shot 0920 hours. Body temp. 40.3° C. Creosote desert, sand course, Dipsosaurus also present. Longitudinal stripes of dorsum at midbody buff color. Buff of dorsum covers most of first full-sized row of ventrals. No gular color apparent.

13 July — Arizona, Maricopa Co., 6.9 mi. WSW Gila Bend. Two animals shot between 0745 and 0750. Body temp. 38.3° (large animal) and 41.2° (subadult (?)). Both foraging on bare open ground between 10–15 ft. ~~o~~ mesquite trees. Mesquite trees in belt adjacent to irrigation canal and about 50 ft. from water. None of species observed in dwarf creosote areas to W of camp. During breakfast from 1 to 4 always in sight about table. One entered garbage pit and left with bit of red hamburger in mouth. Tried to chase animal while food was out of mouth, since frequently dropped and retaken in jaws. Each time animal took flight grabbed meat first. Subsequently both cooked and raw hamburger placed on can lid on ground where it could be readily

W. Riemer
1949

Cnemidophorus tessalatus

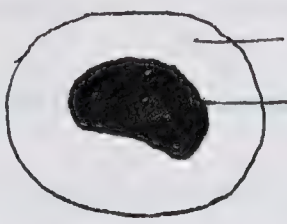
13 July Ariz., Maricopa Co., 6.9 mi. WSW Gila Bend observed. The same animal as was in garbage pit before passed within 3-4 inches of meat without noticing it at least twice. Some of other animals about passed very close without showing interest. Original subject that was chased then shot and R. Stebbins examined stomach contents. Proved to have eaten chunk of cooked hamburger about size of lead pencil eraser but could find not evidence of uncooked meat being eaten. That animal ate meat suggests that olfaction rather than sight entirely used in feeding. In normal feeding appear to dig with forefeet only in leaf litter and loose soil about shaded bases of mesquite and creosote bushes. Both feet used though not alternately, several swipes being made with one foot, a prob with the nose then several with the other or the same foot. Snout rather constantly in depths of hole being dug. Have not seen animals digging in sun.

#265, subadult (?), colors 2½ hours after death. Light areas of dorsum, tan. Salmon-buff on lateral ventrals, posterior half of

W. Riemer
1949

Cnemidophorus tessalatus

13 July Arizona, Maricopa Co., 6.9 mi. WSW Gila Bend
trunk. Top of head, gray, tan, olive.
266, adult, colors in life. Light areas of dorsum, gray-tan, laterally light areas pinkish-buffy-white. Otherwise colors similar to # 265.



Rt eye ⇒ anterior

267, juvenile, taken 1150 in shade of mesquite within 2 ft. of where sitting writing notes. Colors in life immediately after roosting: 4 dorsal longitudinal stripes of gold interspaced with black. Same color from head plates to base of tail. Lateral body wall buff anteriorly to golden buffy in groin. Black in lateral areas reduced to purple-gray. Upper surface hind limbs same gold and black of middorsum. Lower segment on foot of fore limb with lavender hue. Top of head gray with purple and gold added between and posterior to eyes. Distal 2/3 of tail intense powder blue similar to E. skiltonianus blue of young. Salmon-buff invades ventrals laterally. Ventral black essentially absent. Iris same as above except definite green with light yellow.

W. Riemer
1949

Cnemidophorus tessellatus

14 July — Arizona, Pima Co., 1.0 mi. SE Rowood

Single specimen shot at 0822 with body temp. 42.2° C Extremely wary. Associated with Saguaro, creosote, Palo Verde. Uta stansburiana also seen in area. Ground color of dorsum tan. Salmon-tan on postero-lateral portion of ~~ventrals~~. venter.

14 July — Arizona, Pima Co., 36.0 mi. WSW Escuela, State Hwy 86

Two shot. Body temp. 41.2° (1720 hours), 41.8° C (1750 hours). For plants and animals associated see Holbrookia maculata this date. This form occurs with gularis in area. Could see ~~not~~ no apparent segregation ecologically. This form about mesquite, ironwood, gularis seen in sand wash on rocks and amongst prickly pear. Could this be segregation factor? Tessellatus appears to be more abundant by about 3 times. No behavior differences were noted.

280, colors after 17 hours dead; dorsal stripes yellow-tan. No salmon on venter.

281, colors after 17 hours dead; dorsal stripes gray-yellow-tan. No salmon on venter. One of tessellatus on gravelly substate, no rock around, slight slope to ground.

W. Riemer
1949

Cnemidophorus tesselatus

26 July Arizona, Maricopa Co., 10.2 mi. NE Apache Jct., State Hwy 88 Specimen taken on steep rocky hillside with outcrops much fractured rock. Body temp. 40.8 °C when taken at 1850 hours. Goatnut, palo verde(?), cholla, prickly pear associated plants.

W. Riemer
1949

Coleonyx brevis

8 Aug. New Mexico, Eddy Co., White's City

Baby taken 1630 hours under thin slab limestone resting on extensive, surface fractured, limestone mass. Mass sloping at 30° angle into dry stream-bed and facing SW. Afternoon intermittently overcast. Thin layer of clean soil, slightly damp under slab which was 1 in. thick, and twice as large as outstretched hand. Sotol within 12 in of spot and others nearby, ocotillo, prickly pear, mimosa(?). Holbrookia and Urosaurus also present in same small canyon.

Another somewhat larger taken 1640 under more or less round boulder resting on another extensive limestone mass. Soil under rock about 1 in deep and just slightly damp. Soil also banked around margins of rock except at one small point and overgrown with a largely dead moss. Tuft of bunch grass next to stone, other plants same as above. Spot about 50 ft. above canyon bottom.

1650 hours, heavy overcast now, another large juvenile. Rock overlying site 14" by 6" by 2-4 in" thick resting on and partly buried in soil, no rock, except small fragments underneath soil. Moss around rock.

W. Reiner
1949

Coleonyx brevis

8 Aug. New Mexico, Eddy Co., White's City

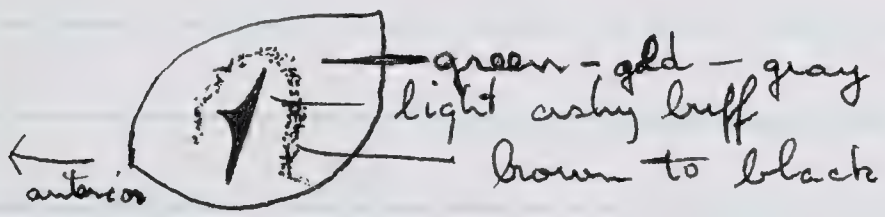
Soil scarcely damp. Site about 12' from previous capture about 55' from canyon bottom and half way to ridge.
423, juvenile, colors in life; venter white with pinkish and blue-black of gut showing through. Body dorsally crossed by bands of sooty brown and pale mustard yellow. Tail ringed by same colors except rings rather weak on ventral surface near base. Top of head with sooty brown as speckle weak centrally and pinkish flesh color showing through. Supralabials and post orbital light stripe white. Limbs pinkish gray dorsally. Spotting of light weak sooty-brown on gular area.
424 and # 425 essentially same as # 423.

W. Reiner
1949

Coleonyx variegatus

11 July Calif., Imperial Co., Imperial Diversion Dam

261, single specimen taken on road at 2030 hours. Dark and showed up well on blacktop pavement. Surrounding area much intersected by large irrigation canals, cultivated fields. ♂, colors in life, dorsal blotches purplish-brown, interspaces transparent lemon yellow. Ventrally entirely white. Anal spurs prominent

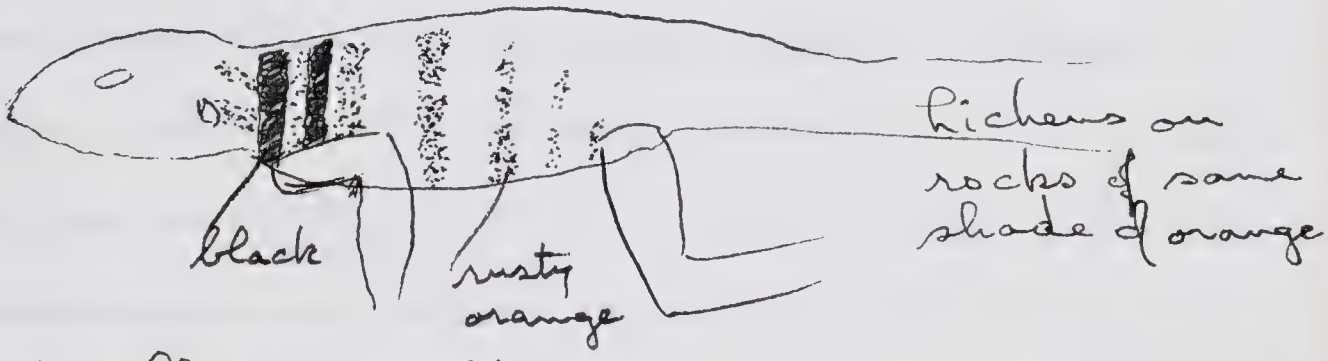


W. Riemer
1949

Crotaphytus collaris

22 June — 34.2 mi. NE Warm Springs, U.S. Hwy 6, Nye Co., Nevada. 2 adults taken on top of rocky piles while running. Weather overcast, cool, and capture with noose easy. Scelo porus occidentalis present.

138 ♀ body temp. 31.8°C., yellowish on dorsal surface of feet and distal half of tail. Fades



proximally on all appendages, on dorsal and anterior surfaces, to insertion of limbs and proximal ⅓ of tail. Also yellowish on snout especially dorsally fading posteriorly on supralabials to just behind eye.

137 ♂ body temp. 37°C., no orange on body, yellow of feet continuous anteriorly on forelimbs to insert of limb. On hindlimbs fades rapidly on lower limb. Absent from tail and snout. Gray-blue suffusion on throat and gular area. Suggestion of bluish anterior to black of groin forward to just behind insertion of forelimb. Iris pale gold.

25 Aug. Colorado,

1130 hours, young specimen taken on largely barren grassy, rocky hillside.

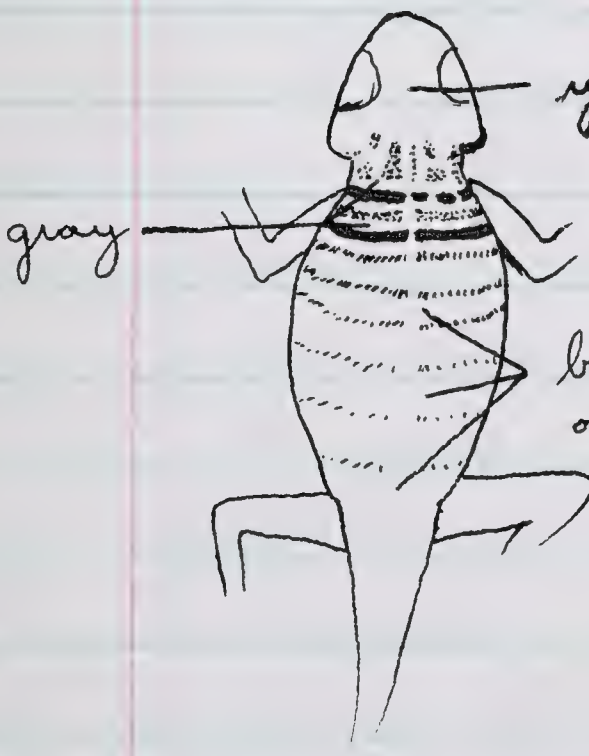
W. Reimer
1949

Crotaphytus collaris

25 Aug. Colorado, Delta Co., 14.6 mi. WNW Delta, U.S. Hwy 50

None of rocks large, all against ground. Animal first noted when running over gravelly soil to shelter at base of tiny bush. Taken by hand. Arid, treeless desert-like situation. Much large rock in vicinity (200 ft.). Associated forms; C. tesselatus, S. undulatus. Large animal seen on rock with blue-green dorsum. Weather, hot and sunny

487, juvenile, colors in life; venter white with faint gray suffusion and faint gray mottling on throat and chin.



Yellow transverse bars tend to become orange at ventral ends. Forelimb and foot dorsally with yellow. Suggestion of same on hind limb. Iris light gold.

rt. eye and →

W. Riemer
1949

Crotaphytus wislizenii

27 June Utah, Juab Co., 26.0 mi. SSW Eureka, sand dunes 2 shot. Body temp. of adult 38.4°C. Extensive, probably several square miles, of sand dunes, some barren other with growth of various annuals. Sages present in depressions between dunes in many places. Other species present: Sceloporus graciosus. Tracks of species not infrequent but in several hours in area only 2 captured. Extremely wary and difficult to approach.
#180, adult ♂, 18 hours dead, transverse body bands buffy cream anteriorly grading to pale lemon yellow at base of tail. Dorsal spots brown. Interspaces pale brown-gray. Dorsal surfaces feet (especially forefeet) with pale yellow suffusion. Gular stripes ~~brownish~~ brownish-~~purple~~ purple. Rest of venter pure white. Had just shed.
#179, young, 18 hours dead, transverse bands cream. Spots of dorsum dark brown. Interspaces grayish-brown. Yellowish of feet largely lacking. Light areas of upper jaw and head appear cream also. Gular stripes dark gray.

W. Reiner
1949

Dipsosaurus dorsalis

9 July Calif., San Bernardino Co., 10.7 mi. NW Riverside Co. line at U. S. Hwy 95 Single animal taken 0845 hours in creosote - mesquite desert. Palo verde(?) and smoke tree present. Body temp. 42.5° C. Abdominal patches present as indistinct area of orange-tan tipped scales Prefrontal region buffy orange. No gular color.

~~# 250, 1 ♂, colors from life. Gular~~

W. Reiman
1950

Eumeces

30 Apr. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.

Single specimen taken in camp area about noon when things were fairly warm. In oak-pine leaf-litter near base of oak. Sudden movement and rustle of leaves betrayed presence of animal. Open woods of pine and oak.

Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose

14 Apr. Specimen of this genus seen in semi-shade in leaf- and needle litter in camp. Could not capture.

30 Apr. Mexico: Guerrero: 2 mi. W Omiltemi, 8200 ft.

#866, dorsum of body golden brown, of tail bright blue, of head brown. Body laterally brown. Stripes above eyes buffy-cream, supralabials pinkish buff. Chin very pale pink, body ventrally darkening to sooty gray at level of hind legs. Under side of tail bright blue as above. Taken under bark of stump in open dry pine forest on steep slope. Dry grass but little understory in immediate vicinity.

W. Riemer
1953

Eumeces sp.

8 July Mexico: Durango: 6 mi. WSW Las Adjuntas, 8500 ft.
Single adult taken under bark of stump (pine) in pine-oak forest shortly after heavy afternoon rain. Rather torpid. Colors when freshly killed (#2043): Tail on all surfaces bright, intense blue except at base. Venter pinkish tinge increasing laterally to dorsal color line. Lateral stripe and face and top of head deep brown. Dorso-lateral light stripe pale gold on head grading to light buff at pelvic region. Vertebral stripe light brown. Labials pink.

W. Riemer
1949

18 July

Eumeces callicephalus

Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs

One specimen seen about 1530 hours at very base of rocky wall forming one side of narrow (6 ft.) stream channel. Strip about 5 ft wide adjacent to wall covered with 6-8 in. course tuft grass. Rocks at that time shaded. Rocks well covered with lichens and few small patches of grayish moss. Disturbed on approach and first seen running along base of wall through grass. Apparently hid at base of wall behind grass. When grass parted in search animal ran out and diagonally across ~~steep~~ steep rock-wall face (75-80°) that had several loose rocks adhering. Refuge taken behind one of loose rocks. When removed lizard escaped again into grass. Further search revealed no trace of animal. Known to be species since bright blue tail and uniform olive dorsum, with two light lateral stripes clearly seen. Appeared exactly like specimen taken earlier in day and described below. Perhaps creatures are responding to heavy rains of yesterday and last night. Soil under tufts of grass and in crevices of rock wall still very damp. Specimen seen

W. Riemer
1949

Eumeces callicephalus

18 July Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs about 20 ft. from where Diadophis regalis taken few days ago. Also present on rock wall in afternoon were Cnemidophorus gularis. Further search for about 15 minutes in vicinity revealed no other Eumeces.

18 July Arizona, Santa Cruz Co., Peña Blanca Springs
Single animal taken in camp ground in small gulch at base of rock formation near ~~cattle~~ guard. One of large rocks forming bed of small gulch overlain by smaller (2 ft. square) rock in part. Between two rocks considerable soft, damp loose, rich-appearing soil. Dry leaf litter piled about edges of overlying rock. When upper rock removed lizard appeared either out of soil or leaf litter and lay quietly on exposed soil. Easily taken by hand. About 0800 hours and animal probably still cool. Rocks here rather jumbled, course surfaced and stained various grays, lavenders and greens, lichens not abundant but patches of green-black masses not uncommon. Emory Oak and a saw-grass plants in immediate vicinity. Leaf litter over ground but not thickly. S. clarkii seen in vicinity in oak.

W. Riemer
1949

Eumeces callicephalus

18 July Arizona, Santa Cruz Co., Peña Blanca Springs
#331, colors in life; dorsum tan with rufous tint. lateral stripe dark brown bordered dorsally by narrow stripe of buffy cream, ventrally by whitish stripe. Top of head brownish tan. Venter grayish white; on throat a salmon luster in most positions while abdominal area very pale blue or salmon luster depending on direction of light. Tail dorsally at base same as dorsum of body grading to tourquoise ~~beginning~~ 1 in. from base and intense blue at 2 in. Newly regenerated tip blue-gray. Ventrally tail powder blue half inch from base grading to blue-lavender ventral to intense blue. Iris black.

W. Reiner
1949

Eumeces multivirgatus

20 Aug. Colorado, Weld Co., 5 mi. WSW Wiggins (in Morgan Co.)
0930, single adult specimen noted as it ran downhill on sandhill through sparse grass apparently toward shelter of low dense shrub. Captured by hand. Sand damp from rain of probably last night, sunny, cool, windy but this spot more or less protected. Near bottom of hill. Terrepene seen several times on hills this morning and only one adult lizard, probably a Holbrookia. Latter not apparently well warmed up, however shrink rapid and active.
#467, adult, colors in life; venter gray white though bluish or buffy depending on angle of light. Ventral surface tail same as body at base though quickly assuming buffy color increasing in intensity distally until orange buff at tip. Dark stripes of dorsum sooty brown. Light portions of dorsum color of thin chocolate drink (buffy tan-gray). Top of head same with more tannish tone. Light line above and behind eye white. Yellow on labials and rostral. Dorsal and lateral surfaces of tail greenish-yellow buff with gray increasing in intensity distally. Regenerated tip with orange buff. Iris black,

W. Riemer
1949

Eumeces taylori

7 Aug. New Mexico, Chaves Co., 2 mi. W Roswell.
1000 hours took single adult under piece of fiber board close to dump area. Weather sunny, clear, not hot. Terrain essentially flat covered with low grasses and other low annuals. One of few Russian thistles in vicinity immediately adjacent to capture site. Dump with old car bodies, cans, cardboard cartons, tires, bottles and logs about 200-300 ft. to N. Fiber board resting on damp ground with little growing vegetation beneath. Some deadish grass present and in one spot forming a roof over small shallow furrow in soil in which animal resting. Animal make only slight movement before capture apparently being light-struck. Board 2½ by 1½ ft. by ½" thick. Had been in place for some time. During afternoon spent about 1½ - 2 hours looking through dump, under logs, cartons, sheet metal both in dump area and isolated positions over surrounding terrain but found no more. Associated forms: Holbrookia maculata, C. gularis and perplexus. This same type of terrain very extensive throughout Roswell area.

W. Riemer
1949

Eumeces taylori

7 Aug. New Mexico, Chaves Co., 2 mi. W Roswell

#421, adult, colors in life; venter faint pinkish salmon such color being evident on scales except marginally where obscured by opaque silvery. Chin and throat without salmon, milkish tone to silver. ~~Both~~ All ~~about~~ above parts of ventral surface with faint bluish cast in certain light angles. Under surface tail with tannish yellow on scales. Silver margins prominent near base but rapidly disappearing causing tan-yellow to become more intense distally. Dorsal color head and body where old skin still intact a golden brown with slight olive tinge on head. Where old skin just shed color a golden ~~gray~~ish tan. Much iridescence. Dorsal body color changes rapidly at base of tail to olivish yellow grading to tannish yellow of ventral surface toward tip. Supralabials same color as chin. Iris deep black brown or black.

W. Riemer
1950

Gerrhonotus

28 Apr. Mexico: Guerrero: 3 mi. W Omiltemo, 8200 ft.
#849, dorsum tannish-gray with sooty vertebral spots. Venter milky with black specks and pinkish iridescence especially laterally. Regenerated portion of tail dorsally yellow-tan. Dark line through eye brown gray margined with sooty black. Light line below eye milk with pinkish hue. Iris reddish gold. Taken while sunning(?) in late afternoon while clinging to vertical, and new, road cut about three or four feet from both top and bottom. Mixed pine-oak forest, steep slopes. No attempt at escape.

29 Apr. #861, dorsum brown with black small spots. Venter milk with blue-gray large flecks. Light line below eye creamy buff. Area of eye black.

2 May Young individual taken in camp in dry oak leaf litter, open pine-oak forest on dry ridge.

W. Riemer
1947

Gerrhonotus c. coeruleus

3 3/10 mi. S. San Francisco Co. line, Skyline Blvd., San Mateo Co., Calif.

25 Aug Two individuals taken at this point. One under rusted iron sheeting, one at edge of thistle. Both half grown. Other areas nearby in which growth less dense were not apparently occupied. Weather not warm.

3/10 mi. S. San Francisco Co. line, S. tip Lake Merced, San Mateo Co., Calif.

25 Aug One very small individual taken crossing bridle path. Surroundings of conifers, dried grasses, tangles of blackberry. Very dry and dusty. Species said to be very numerous in this area by W. Fox.

M. V. Z. Laboratory, Univ. Calif., Berkeley

8 Sep. Four young born to a Gerrhonotus c. coeruleus in the lab. sometime between 130006 Sept. and 090008 Sept 1947. (Female is Specimen C., Exper. #1, Notes on Water Absorption in Reptiles and Amphibians).

W. Riemer
1947

Gerrhonotus c. coeruleus

M.V.Z. Laboratory, Univ. Calif., Berkeley

8 Sept. .... Probably births occurred during afternoon or evening of 7 Sept. or very early morning 8 Sept. Young perfect replica of parent except in coloration. Entire upper surface of body from snout to tip of tail copper-bronze color (approximating "Buckthorn brown" (Ridgeway 1912)). lateral surfaces same color with small black spottings or dots of pigment producing a much darker effect. Dark, longitudinal, intercostal lines evident on venter as in adult. Dorsal stripe 6 full 2 half scales wide, as in adult. Young active and react just as adults. Efforts to eat newly hatched cockroaches made but not observed to be successful. Young 8.0, 8.3, 7.8, 7.6 cm. in total length.

Adult follows pattern of young and lacks the customary vertebral blotches. 16.5 cm. with regenerated tail and 10 cm. snout to vent.

D. Riemer
1947

Geothonotus c. coeruleus

M. V. Z. laboratory, University of California, Berkeley...

17 Oct. One of four escaped, was crushed underfoot and died.

24 Oct. Other three killed.
One not to be kept for M.V.Z. collection.

W. Riemer
1952

Gerrhonotus coeruleus

5 Feb. Calif.: Del Norte Co., 2¼ mi. S, 2¼ mi. E Fort Dick

One subadult running at base of fallen log in cut over clearing full of such logs and stumps. Redwood, Doug. fir forest. Scattered pools. Hyla chorusing. 1030 hrs. clear, sunny, cool.

30 May Calif.: Butte Co., Butte Meadows

1 adult taken at edge of corral immediately adjacent to stream of slight flow. Open pine needle forest floor. No sign of abdominal stripes. Peculiar greenish hue.

1 large adult with stub tail taken under overhanging edge of old, 6 inch diameter log at edge of grassy meadow in yellow pine, incense cedar, Douglas Fir forest. Meadow area extensive in length but narrow — only in vicinity of small slowly flowing stream.

1 large adult 2 feet above ground in dead branches of fallen fragment of incense cedar about 6 feet from edge of rapid 20 feet wide stream. Warm, sunny, clear 1415 hrs.

W. Riemer
1952

Gerrhonotus multicarinatus

2 Mar. Calif.: Butte Co., 3/4 mi. W, 2 3/4 mi. S Bidwell Bar

Adult taken under strip of log on ground but with actual substrate of damp bark fragments. Much litter on ground — logs, boards, sheet iron, etc. Apparently abandoned lumber mill. Open grassy slope. Scrubby oaks and digger pine in open stands on surrounding slopes.

Weather clear, warm, sunny.

5 Apr. Calif.: Alameda Co., 4 3/4 mi. E, 2 mi. S Mission San Jose

Subadult taken in shade at edge of road. Seep along bank. Body temp. 24.6°C at 1230 hrs.

W. Reiner
1949

Holbrookia maculata

14 July Arizona, Pima Co., 36.0 mi. WSW Escuela, State Hwy 86
4 specimens taken, 2 shot, 2 noosed. Abundant, though not easily separated from Callisaurus on sight especially when running. ~~Body temp~~. Area of collection with gravelly substrate, sandy rivulet washes. Plants: Ironwood, mesquite, palo verde, saguaro, prickly pear, cholla. Associated animals: Callisaurus draconoides, Cnemidophorus tessalatus and gularis, Urosaurus ornatus. Callisaurus and species both in same situation. What separates two ecologically? Nothing was apparent in separation of animals except Holbrookia is slower, smaller, much less wary.
#276 ♀, body temp. 40.4° C taken 1700 at base of ironwood. Colors after 16 hours dead; gular patch of bright orange, pale orange in axilla. Appears to be yellow laterally on base of tail and in groin. Ground color of dorsum gray, color immediately anterior black transverse markings yellow-tan.
#277, ♂, taken 1730 under mesquite tree. Colors 17 hours after death; gular gray with faint suggestion of orange central patch. Immediately surrounding and between abdominal black spots blue gray.

W. Reiner
1949

Holbrookia maculata

14 July Arizona, Pima Co., 36.0 mi. ~~ESE~~ WSW Escuela, State Hwy 86 (# 277, cont'd.) Yellow suffusion between limbs laterally and ventrally as far medial as medial edge black spots. Develops orange tinge anterior to spots ventrally. Vertebral area dorsum ~~yellowish~~-gray, blotches tan.

278, ♂, colors in life; black abdominal spots surrounded by chalky powder blue, very pale orange between blue and axilla, lemon yellow between blue and groin extending to knee. Yellow suffusion over all of dorsum except tail and vertebral area showing most clearly in light spots. Lateral surface tail at swelling pale gray changing to pale green from swelling to ~~midpoint~~. halfway point. Gular slate gray with but faintest suggestion of central orange patch. General tone of body dorsum gray-tan.

279, ♀, colors in life; brilliant orange patch at rear of gular area, pale orange present in axilla and extending back as far as appressed elbow, in front of forelimb and beneath gular fold almost to midline, below and behind eye, as specks on supra- and infralabials and very pale orange ventral surface tail between swollen area and midpoint. Yellow between axillary orange and groin.

W. Reiner
1949

Holbrookia maculata

14 July Arizona, Pima Co., 36.0 mi. WSW Escuela, State Hwy 86

(#279, cont'd.) Ground color dorsum slate-gray. Narrow, black, wavy transverse lines grade anteriorly to brown, tan, yellow-tan, gray; black bordered posteriorly by white segments or spots. Iris black.

Last two Holbrookia described had body temperatures of ~~41.1~~ 41.1° (1735 hours), 40.1° C (1745). Both noosed, one from under mesquite shrub. Not particularly wary, noosing being easy

16 July Arizona, Santa Cruz Co., Peña Blanca Springs

1 specimen #292 noosed while in bright, hot sun. Body temp. 43.8° C. When noosed animal standing stiff legged with body well off surface of small rock. All four legs flexed in unison giving animal appearance of jumping rather than bobbing seen in Sceloporus. At same time mouth loosely open. Threatening posture or was animal attempting to escape heat? Not wary in spite of heat. Area one of small fist sized rocks on open thinly grassed canyon bottom adjacent to wash. More seen on slopes above canyon floor. Colors in life; ♀, gular bright orange,

W. Reiner
1949

Holbrookia maculata

16 July Arizona, Santa Cruz Co., Peña Blanca Springs
(#292 cont'd.)
Orange of side of head, in front of shoulder, beneath gular fold, pale. In and behind axilla bright but thin. From appressed elbow to groin lemon yellow. ~~Dorsal~~ Dorsal colors of one blotch posterior to anterior ash gray, black, brown, tan, tan-gray. Iris black.

18 July Arizona, Santa Cruz Co., ~~Fay~~ Sycamore Canyon, ¼ mi. SW Yanks Spring Single animal roosed in canyon bottom bottom at edge of fine talus and close to channel of stream. Small willows about. No large trees in vicinity. Grass sparse. Seem more confined to drier areas of canyon than G. gularis and S. clarkii, at least not present in lusher areas with grass and trees. Body temp. 38.0° C.

24 July Arizona, Cochise Co., 32 mi. NE Douglas, U.S. Hwy 80
Single animal roosed at 1210, body temp. 37.6° C. Bunchgrass 12-18 in. on heavily grazed land. Except for grass tufts ground largely barren. Soil reddish and rocky. # 373, adult ♀, colors in life; venter white except for black abdominal marks and small weak yellow-orange irregular spot posterior edge of gular area. A weak gray surrounds

W. Reiner
1949

Holbrookia maculata

24 July Arizona, Cochise Co., 32 mi. NE Douglas, U.S. Hwy 80
(#373 Cont'd)
black marks. Top of head dark tan with olive, dorsum of body vertebrally brown with tan, scattered small specks of lighter. Dorsum of tail same as body except on basal 1 in. only place pattern evident on animal. Laterally a mottling of yellow and orange red between angle of jaw and insertion forelimb. From above insertion forelimb to insertion hind limb area of light old-rose most intense above axilla and forming suffusion dorsally over entire area with tannish brown dorsally, also suffusion dorsally on thigh. Slash of light carmen at junction hind limb and tail extending ¼ in. along posterior surface thigh and ¼ in. along lateral surface tail base. Carmen on tail followed by ½ in lemon yellow. Iris black.

5 Aug. New Mexico, Otero Co., White Sands Nat'l Monument
Two specimens taken. Do not seem abundant as designated by Ruthven (1907). To our disadvantage as collectors was fact that sand was still wet from previous days rain and temperatures not high — partially as result of surface evaporation. Both taken in shelter

W. Riemer
1949

Holbrookia maculata

5 Aug. New Mexico, Otero Co., White Sands Nat'l Mon.
♂ a bush, one ~~sss~~ sumac. Seems limited to white sand dunes and not occurring in brownish and reddish depressions. Associated animals also taken, Sceloporus undulatus in about equal abundance and Cnemidophorus perplexus apparently more common. All forms much bleached. Even though not thoroughly warmed Holbrookia more wary than others taken in other areas.
#416, adult ♀, colors in life; entire ventral surface white and immaculate except gular region with very faint traces of grayish diagonal bars laterally and faint yellow-orange patch posterior edged gular medially. Dorsally animal ash gray with series of weak blotches on each side vertebral line with tarnish tone to ash gray. Faint suffusion of salmon-orange laterally on body especially prominent where concealed by appressed humerus. Only a trace of color even there. Weak butter-yellow on upper eyelid and about nostril. Dorsal surface limbs almost white with faint salmon again

W. Riemer
1949

Holbrookia maculata

5 Aug. New Mexico, Otero Co., White Sands Nat'l Monument on posterior surface of thigh. lateral abdominal bars jet black.

7 Aug. New Mexico, Chaves Co., 2 mi. W Roswell 1430 hours specimen roosed at edge of dump area. Terrain flat, open, treeless, barren, except for clumps of Russian thistle in immediate vicinity of capture, while surrounding area with low cover of grass and other annuals. Short-grass prairie. Sunny with scattered clouds. Body temp. 39.0° C. Associated animals: Eumeces taylori, C. gularis and perplexus and Colubra (flagellum (?))

422, adult ♀, colors in life; venter white. Only faint suggestion of gular patch. Vertebral stripe chalky gray, ground color grayish light brown with darker spots of weak blackish. Dark spots not very prominent or distinct. Light spots on body from vertebral line to venter light yellow and on neck grading to pale salmon. Top of head tarnish gray. Yellow of body extends ventrally to medial edge of jet lateral abdominal bars. Bluish between and surrounding bars. Iris black. In handling vague grayish oblique stripes appeared on throat.

W. Riemer
1949

Holbrookia maculata

20 Aug. Colorado, Weld Co., 5 mi. WSW Wiggins (in Morgan Co.)
1100 hours, an adult seen under small piece of dead yucca laying on almost bare sandy slope of low road cut. Escaped by running up bank, through grass to shelter of small shrub. Though all of sand damp from rains last evening especially damp under piece of yucca. Warm, windy, sunny. Others on occasion seen running to shelter of brush on sand hills earlier in day. Sand is warm enough for animals to be out, 46.2° C just below surface, does the wind inhibit activity. At same place individual of this years crop taken with head only buried in damp sand under cow pad in same situation. No escape attempted.
#466, new born of year, colors in life; venter white, abdominal lateral marks black with faint blue surrounding. Otherwise yellowish between limb insertions. Dorsal ground color (as on vertebral stripe) lavender gray. Blotches brown posteriorly and golden tan anteriorly. Top of head gray-tan with rusty bar on upper lids and behind nostrils. Iris black. Pale yellow also laterally on base of tail and posterior portion thigh.

W. Riemer
1950

Holbrookia texana

9 Mar. Texas: El Paso Co., 10 mi E, 3½ mi. S Wt. Franklin

Single specimen seen and taken in area populated by Uta stansburiana This specimen taken in large clump of a thorny mesquite-like shrub along with an Uta. Clump at base of steep sandy-gravel bank. For description of area see Uta, this date.

W. Riemer
1953

Holbrookia texana

6 July Mexico: Durango: Rio Nazas at San Salvador

4 adults taken on sandy flats near river. Cotton fields (now unplanted) and mesquite. Colors in life: Venters ♀♀, orange throat spot and also ventro-laterally behind forelimb insertion to ventro-lateral black slashes (slashes faint in ♀♀). Faint yellow medial to orange of venter grading into faint greenish posters-laterally. ♂ lacks orange ventrally but yellow and green prominent. Small orangish spots grading to yellow in groin present dorso-laterally in ♂, lacking on ♀♀.

W. Reiner
1949

4 Aug.

Phrynosoma douglassii

New Mexico, Otero Co., Cloudcroft ~~8900~~ 8600 ft. ±

Single specimen taken at 1025 hours at base of large fir (?) No sun during morning, overcast heavily, raining lightly at time of capture, soil saturated. Spotted movement in cleft of trunk in moderately dense forest while looking for Plethodon hardii. Movements slow, probably due to wet and cold. Probably had been driven from refuge by rain.

415, adult, colors in life; venter milk white with irregularly scattered, numerous pale yellow scales most with salmon proximally especially near midline. Venter as result a rich cream with orange tinge from distance. Yellow extends along limbs to feet. Small scales of gular fold and few rows of ventrals immediately posterior almost entirely rusty orange, those just preceding fold lemon yellow with rust orange proximal ends. Rest of gular essentially milky white. Nuchal patches sooty brown margined medially with black. Other dorsal dark spots sooty brown. Vertebral line gray with little light brown. More laterally brown with gray and touch of

W. Riemer
1949

Phrynosoma douglassii

4 Aug. New Mexico, Otero Co., Cloudcroft, 8800 ft ±
rust. Stripe of rufous on anterior half body
just above abdominal fringe. Concealed
portion infralabials orange anteriorly to
orange carmen near angle of jaw.
Temporal region with faint suffusion
of rufous. Iris black.

W. Riemer
1949

Phrynosoma platyrhinos

21 June 2 mi. S Beatty, Nye Co., Nevada

133, ♂, taken at 1100 hours sunning on small rock in hot sun. No attempt to escape. Coloration as follows: Dorsum with black, roughly transverse bands. Nuchal, three body, and 3 anterior caudal bands margined behind by narrow bands or spots of cream. This followed by slightly greyish white zone with scattered flecks of rust in posterior half. Rust color most intense laterally and anteriorly. Also a longitudinal line of rust of intense shade immediately dorsal to and extending length of lateral abdominal fringe scales. Is purpose of cream bordering black to accentuate line and cause appearance of relief? Venter white with very weak scattered ~~black~~ gray spots on throat and chest and abdomen except extreme posterior portion. Here spots black as are those on postero-ventral surface ~~femur~~ thigh and pre-anal region. Caudally spotting slightly paler.

W. Reiner
1949

Phrynosoma solare

15 July Arizona, Santa Cruz Co., 2 mi. NNW Nogales, State Hwy 89
6 animals taken in late afternoon in pit under cattle guard in front of Forest Service Station. Pit concrete with 12-18" walls. Perhaps ~~toads~~ lizards fall in and can't escape, perhaps a regular population exists there. Pit 10 to 12 ft. square and yielded 4 immature and one very large animal. Addition animal taken from pit morning of 16th. Animals semi-buried in loose soil at bottom of pit in afternoon, warm but animals not active. Many dozen "stink bugs" in clusters in pit. Also dead V. alvarius. Though no ants noted at time all lizards appeared healthy and well-fed. One animal taken from N. pit, 5 from S. pit.

W. Riemer
1950

Sceloporus

26 Mar. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.
1715 hrs. One animal taken under dry bark of vertical dead stump about 2½ ft from ground. Animal's temp. 19.2° C and animal very sluggish and easily taken by hand. When first exposed ran around trunk but very shortly returned as if it retire again as quickly as possible. Site in open pine-oak woods ⅓ just over ridge on N facing slope. Bolitoglossa taken inside of rotten portion of stump.

10 Apr. Four specimens taken in cleared area which had abundance of stumps and fallen logs but only shrubs and grass for live growth. Also present were Sceloporus (orange bellied) occupying adjacent stumps and logs. In one case both species taken within 6 in. of one another under bark of stump. All of this species taken on stumps none on fallen logs. Retire under loose bark and run on flat tops of stumps. One seen to leave stump, run across ground to capture an insect (?) several feet away. Temp. of lizards taken rectally: 25.4° C under bark resting in early morning; 32.0°; 34.0°; 34.6° C all running. Colors: venters turquoise to ultramarine, in young bellies pinkish between abdominal patches and chins with yellow. Dorsums yellow-green, green, brownish yellow. Tails sky blue, turquoise,

W. Riemer
1950

Sceloporus

1 Apr. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.

ash gray and gray brown.

4 Apr. Specimen taken on rocks on steep forested slope. Semi-shade at time. Weather; warm, clear, sunny. Back brassy-green, tail blue as in other specimens but top of head bright orange tan, anterior portion of gular area and labial region to ear bright orange. Rest of gular blue. These colors even present during night when animal cool. Above applies to # 737.

5 Apr. Today in driving to Comitan saw several individuals perched on rocks along the road in semi-open forest situation. This species than does occupy both rocks and stumps, both even when both are available. Several of the animals showed the striking orangish head and green body making them easy to spot on the gray rocks.

W. Riemer
1950

Sceloporus

28 Apr. Mexico: Guerrero: 3 mi. W Omilteme, 8200 ft.
850, dorsum of body yellow tan with dusky suffusion and longitudinal stripes of deep sooty brown between scale rows. Top of head black-brown with two medial white spots. Abdominal patches and entire gular tourquoise the former margined medially by black, the latter with black collar posteriorly but incomplete dorsally. Light line below and anterior to eye. Iris gold. Limbs with yellow hue. Taken on vertical trunk of tree in camp about one foot from ground. Mixed pine-oak forest, steep slopes.

1 May (# 1247 F. Pitelka) Dorsally dark mustard with black, longitudinal, interscalar stripes. Top of head same black and mustard. Abdominal patches pale greenish blue margined medially by black (weak). Gular mustard yellow anteriorly grading to powder blue posteriorly and margined posteriorly by black collar incomplete dorsally and ventro-medially. Yellow behind collar on venter. Taken on stump in dry, open, mixed pine-oak forest.

W. Riemer
1950

Sceloporus

30 Apr. Mexico: Guerrero: 3 mi. W Omiltemo, 8200 ft.

♂♂ # 862-863, dorsum yellow green with tarnish suffusion, sooty brown to black indistinct transverse bars and collar. Venter & body pinkish- to pale-buff. Abdominal patches pale blue margined medially with black. Throat with scattered pale blue scales. Under side & tail pale to bright orange.

♀♀ # 864-865, dorsum brown, gray, and sooty with no sign of greenish of ♂♂. Venter & body pale orange to pale mustard. Faint blue flecks on chin. No sign of abdominal patches. Under side of tail same as body.

All four taken this date on logs or branches of slash waste in mixed oak-pine forest in dense stand or at edge of open and dense timber. In all cases much dense understory present. Wary.

W. Riemer
1950

Sceloporus

10 Apr. Mexico : Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose
Single specimen taken on top of burnt 5 ft. stump in small opening in pine woods. Body temp. 33.8°C. Orange throated species of Sceloporus also in vicinity, Anolis and a large unidentified species of this genus also. # 769, color of dorsum brown vertebrally, buffy cream (but not bright) dorsolateral stripe, rich reddish brown laterally. Abdominal patches violet laterally, pale blue and then dark grayish blue medially. Gular faintly blue. Lower labial region, especially anteriorly with orange suffusion. Tail lighter than body.

15 Apr. One specimen shot on log in sun in early afternoon in mixed woods. Also on log and also shot was a orange-throated Sceloporus.

20 Apr. Small specimen probably ♀ this species taken under piece of log in open mixed forest on grassy slope. Scrubby understory present. Adult specimen taken on stump in open mixed woods. Much understory. Animal barely active. Body temp. 21.8° C.

W. Reiner
1950

Sceloporus

10 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose # 768, color dorsally gray brown with black markings. Abdominal patches pale silvery-blue margined with blue gray medially. Reddish orange in region of lower labials with very intense patch behind and below ear extending to insertion of forelimb. Taken on dark gray rock in open area in woods. On slope with small rock outcroppings, bracken fern and blackberries. Undis taken nearby. Body temp. 35.4°C.

15 Apr. Single specimen shot on log in sun in early afternoon in mixed woods. Also shot on same log was a violet-bellied Sceloporus.

W. Reiner
1950

Sceloporus

10 spr. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft. -
Eight specimens taken from cleared area along with four ♂ Sceloporus (blue-bellied) species. See that account. Could detect no apparent segregation of species except that this species did occupy fallen timber while other species only taken of stumps. Too few specimens taken however to prove preferences. This species also occupying stumps and in one case on same stump as one of other species. One young specimen taken on pile of chopped wood in small opening in forest and an adult taken amongst open stand of young trees (10-15 ft.) on a rotten log. Two ♀♀ taken sunning on same log within 3-4 in. of one another. No animosity shown. Often sunning lizards, on approach, appear to be dozing. Temp. taken rectally; 18.3° early morning, under bark; all sunning 31.0°; 33.2°; 28.4°; 30.0°; 26.6° retired for evening and when disturbed emerged but almost immediately retired into log crevice again. Colors: Venters brick orange to whitish, gulars brick orange to sooty, on some yellow on chin. Dorsum yellow green to gray brown to black.

W. Riemer
1953

Sceloporus sp.

15 July Mexico: Sinaloa: 9 mi. N Mazatlan, 100 ft.

Single adult ♀ taken from dead stump in thorn forest. Colors, # 2163, freshly killed: Venter with pair of very pale blue belly patches margined laterally by a narrow zone of rich salmon from axilla almost to groin. Scattered pale blue scales on chin and gular.

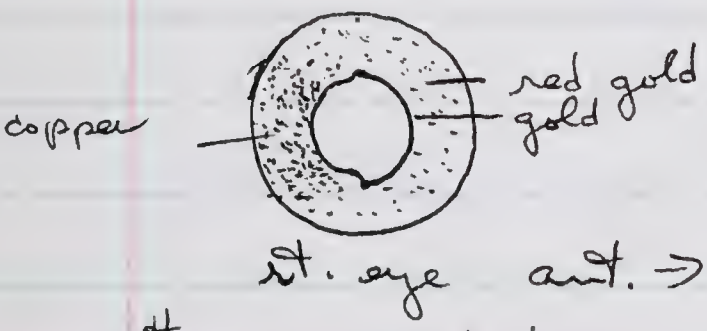
W. Reiner
1949

Sceloporus clarkii

16 July Arizona, Santa Cruz Co., Peña Blanca Springs

2 taken in late morning. One #293 ↑ moved in willow. Found head downward 8 feet off ground At edge of wash lined with willows(?) and walnuts. Body temp. 34.5° C.

293, colors in life, ♂, abdominal patches powder blue darkening medially and posteriorly becoming tourquoise laterally. Scattered pale greenish-blue spots irregularly placed on scales of dorsum. Light zone behind collar bluish white. Ground color of dorsum brownish-gray with metallic luster. Tail with very faint blue suffusion ventro-laterally to 3 ½ in. from base. Gular patch powder blue with touch of gray. Iris:



rt. eye ant. →

294, shot in walnut tree 12 ft. off ground, next to wash. In shade hanging head upper-most. These animals very always dodging to opposite side of trunk or limb and usually running upward as well. Body temp. 34.2° C. Abdominal patches purple-blue anteriorly, fading postero-laterally but becoming intense

W. Riemer
1949

16 July

Sceloporus clarkii

Arizona, Santa Cruz Co., ~~Pena~~ Peña Blanca Springs

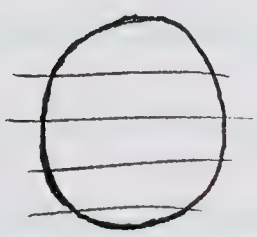
deep blue nearest groin. Laterally blue centrally placed on each scale and of turquoise hue. Dorsally blue pale and in irregularly scattered small spots. Collar not apparent. Throat patch same blue as abdominal patches. Laterally and anteriorly gular patch covered by dark gray. Tail with irregular turquoise spots dorsally, intense blue laterally grading to purple-blue ventrally. Applies to basal 2 inches of tail only. Dorsal ground color tan-gray with bluish metallic luster. Colors from animal 5 hours dead.

Large individual taken on trunk of large tree of unknown sort. Spotted as frightened upward from base of tree. Circling tree to keep out of sight climbed to height of about 10 ft. off ground at which station, head uppermost easily noosed. Body temp. 32.8° C, sun just setting behind hills. Cool. Tree at edge of main canyon wash. Seemed darker than those on which color notes taken at mid-afternoon when temp. higher. Was lizard moving toward ground to take shelter in hole or burrow for night? Taken at 1830 hours.

W. Riemer
1949

Sceloporus clarkii

16 July Arizona, Santa Cruz Co., Peña Blanca Spring
#298, ♀, colors in life, abdominal patches turquoise medially and posteriorly fading rapidly to pale green-blue central scale spots on sides of body. Irregular dorsal spots pale bluish green. Gular patch turquoise. Faint green-blue laterally on proximal 2 inches of tail.



left eye

Note shape of pupil!
ant. ←

Dorsum tarnish gray. Red mites concentrated in and between rictal and tympanum.

18 July Arizona, Santa Cruz Co., Yank Springs, Sycamore Can.
Animal taken inside open concrete reservoir while resting on float mechanism. About 1-2" water surrounding perch. Morning still cool and easily taken with hand. Made no attempt at escape. Color very dark with no sign of dorsal blue spots. Probably just emerged to sun for morning yet no spot for concealment appeared available.

W. J. Riemer
1947

Sceloporus graciosus gracilis

Lassen Volcanic National Park, Calif.

9 Aug. The past three days have been spend in capturing this species in the Chaos Jumbles area of Lassen Volcanic National Park.

Certain observations were made. The animal is very well adapted in coloration to the substrate and is but rarely detected except by its characteristic short dashes. It was found most successful to skim the ground in wide arcs with the eyes from 10 to 50 feet to the front. Upon approach the animals would make a short dash the movement of which showed the presence of an animal. Dashes were generally of but a short distance usually less than 10 feet but occasionally one would run 50 feet or more. By giving chase and not permitting the animal to rest between dashes it could soon be tired and confused to such an extent that

W. Riemer
1947

Sceloporus graciosus gracilis
cont.

Lassen Volcanic National Park, Calif.

9 Aug. it could be rather easily picked up in the hand. At other times roosing was easier. However it was noted that this species was more wary of a noose and more difficult to secure by that method than Sceloporus o. occidentalis.

In general it was felt that the animals were not abundant. At one spot 4 were taken in about 10 minutes but at other times a half-hours search would reveal none. During the four days work in the study area of this species 72 individuals were captured by R. Stebbins and myself. More were seen but escaped capture. A possibly reasonably number would be 100 individuals seen.

The study area was a relatively sterile area covered with rocky rubble and ~~covered~~ with a population of pine and fir. Jeffery, yellow, white,

V. Riemer
1947

Sceloporus graciosus gracilis
cont.

9 Aug. Lassen Volcanic National Park, Calif.

~~and~~ sugar, ~~pine~~ and lodgepole pine, white and red fir. The commonest smaller plants were tobacco bush, manzanita, cream brush or ocean spray and lupine. Areas fairly well shaded by trees and with a good cover of pine needles were not inhabited by this species and seemly they prefered areas extremely open and entirely rocky ~~to~~ or those rather sparsely vegetated. Use was made of this vegetation for concealment and escape. Tree climbing was resorted to in some instances tho never did the animals climb more than a few feet.

The study was largely a study of home ranges. Apparently the animals do not range far since some of those captured were in about the same area inhabited ~~5~~ 1 (1942) years previously. They all seem to have a very limited

W. Riemer
1947

Sceloporus graciosus gracilis
cont.

Lassen Volcanic National Park, Calif.

9 Aug. operating range which observations indicate they know very well.

Quite often when grabbed these animals would emit a faint squeak.

Often it was noted that these animals occurred in pairs, especially in sparsely inhabited areas. The individual often appeared to have a "home" or favorite crevice, often under a cap rock, to which it returned day after day.

Once when holding two young in opposite hands, yet closely together, the two viciously bit at the other's neck or body.

R. Stebbins estimates that this species in this area reaches adult size — about 53-55 mm. — at three years. If true, some of the animals handled were at least eight years old.

Subway Caves, Shasta Co., Calif.

9 Aug. A single specimen observed and

W. Riemer
1947

Sceloporus graciosus gracilis cont.

Subway Caves, Shasta Co., Calif. cont.

Aug 9 taken in same area and habitat as S. o. occidentalis. (See that species).

D. Rieman
1948

Sceloporus g. graciosus

0.2 mi. SSW Vernal Falls, 5481 ft.,
Yosemite National Park, Mariposa Co., Calif.

1 July Two animals, # 83-84 of three seen, captured. All those seen were confined to spots seemly sunny most of day. The two captured made free use of large granite boulders for activities and one even tried escape on dried twigs of plant reaching to an adjoining rock. Both were extremely wary of noose. No others seen though several hours spent on trail in seemly spots.

W. Riemer
1949

Sceloporus graciosus

23 June Utah, Salt Lake Co., 20 mi. NE Grantsville, U.S. Hwy 40 #150, Single animal taken near shore of Great Salt Lake. Late afternoon, cool, hiding under large fragment of clay pipe. Short sparse grass with occasional low scattered sages(?) Flat ground. For color notes see R. Stebbins

26 June Utah, Utah Co., 7.6 mi. (by rd.) E Springville, Hobble Creek. 2 ♂♂ taken in early afternoon while rocks still warm though overcast and threating rain. #157, ♂, body temp. 24.8°C, on rock pile in rocky area in ~~grove~~ grove of small Quercus. Pile probably receives sun only one-half of each day. Not wary. The other, #158, ♂, body temp. 29.5°C, in rocky, dry, small tributary canyon, on rocks. Wary. Sage(?) in bottom and Quercus (small) on banks. Pigmentation as follows: #157, ventral blue patches pale sky blue laterally but increasing in intensity medially. Medial black border irregular and faint. Suggestion of pinkish lateral to blue. Dorsal overall color tan with trace of pinkish. Iris golden. No blue on throat but simple suffusion of dusky. Base of tail much swollen. #158, ventral blue slightly darker and grading into pinkish-orange suffusion laterally and between limbs. Gular area pale dusky with faint traces of blue-gray posteo-laterally on that area. Iris pale gold.

W. Riemer
1949

Sceloporus graciosus

27 June — Utah, Juab Co., 26.0 mi. SSW Eureka, sand dunes. Abundant, 2 body temps. of captured animals 37.0° & 36.8° C. Both in shade of juniper. 4-6" weed growth. Sandy substrate. For other factors environment see Crotaphytus wislizenii this date. Very wary. Also abundant in dead tangles of a small thorny plant. No present on very open sand but confined to shelter of dense growth.

177, adult, 18 hours dead, all blue of throat lacking. Abdominal patchs powder-blue darkening toward midline and grading to yellow-green laterally. Above yellow scattered spots of red-orange between limbs giving orange suffusion to area. Medial black edges of blue essentially lacking. Deep, intense blue spots laterally on anterior third of tail.

178, young, freshly killed, blue lacking on throat, of abdominal patches, pale, powder-blue with slight grayish cast. Mere suggestion of pinkish between limbs. Dorsal colors ~~###~~ medial to lateral: grayish-tan, yellowish-tan and brown, pale buff, greenish-gold and brown, pale buff.

W. Riemer

Sceloporus graciosus

29 June Utah, Garfield Co., 19.2 mi. SSW Junction, U.S. Hwy 89 # 182, young, only faintest suggestion of abdominal blue; same for axillary orange spot. No gular blue. Tail appears abruptly and essentially unmarked.

30 June Utah, Kane Co., 4 mi. SE Alton, Sink Valley # 184, Adult ♀, ~~shoot~~ shot, taken in base of sage at edge of gully. Oak thickets close by as well as cultivated wheat. Colors when dead 18 hours. Abdominal patches pale powder blue. Orange axillary spot trailing faintly posteriorly to hind limb. Orange on labials below eye, on gular area below angle of lower jaw, about ear opening and posterior on neck to shoulder girdle

30 June Utah, Kane Co., 0.2 mi. W Glendale, U.S. Hwy 89 4 taken alive with following temp. 36.4°, 36.0°, 35.9°, 36.4° C. 1 shot and no temp. data. Situation: narrow valley between low mountains, floor green and lush with cottonwoods, willows(?), and cultivated grain. Moderately high yellow sandstone cliffs with talus boulders below. Oaks, sages, juniper on talus. Species occupying rocks generally in vicinity of sage clumps

W. Riemer
1949

Sceloporus graciosus

30 June Utah, Kane Co., 0.2 mi. N Glendale, U.S. Hwy 89 which afford excellent cover and occurring in wash as well as at lower parts of talus. S. undulatus though not as abundant taken in same area in same situation exactly except none noted except at base of talus. Graciosus and undulatus taken within 6 ft of one another. What is ecological segregation here? Are food preferences different. What are social relations? Do species respect one another's territories.
colors in life
#190, adult ♀, abdominal patches pale powder blue tending to yellowish medially. Gular area pale yellow. Pale yellow also in groin, postero-ventral surface thigh, under surface tail. Orange on posterior labials, about ear opening, rictal, antero-dorsal to fore limb insertion, axilla, and as salmon suffusion posterior above blue to almost insertion hind-limb. Median dorsal stripe brownish gray with touch of blue. Next lateral stripes rusty tan. Iris light gold.
#189, adult ♀, colors in life, same as above except touch of pale blue in gular area below ear. Also orange of rictal, ear, labials (almost to nares), extremely brilliant.

W. Riemer
1949

Sceloporus graciosus

30 June Utah, Kane Co., 0.2 mi. N Glendale, U.S. Hwy 89.
Orange also about eye. Axillary patch weak.
Dorsal stripes just lateral of vertebral, ~~yellowish rusty tan~~ yellowish-rusty-tan
188, adult ♀, colors in life, same as # 190 except laterally abdominal patches attain powder-blue, pale powder-blue scattered over and amongst yellow of gular area. Yellow of hind limbs and tail weak. Vertebral stripe gray with purple touch. Stripes just lateral, yellow-tan. Iris gold.
187, adult ♀, colors after dead 18 hours, same as # 190 except orange of head and neck more intense and present in eye lids. Especially brilliant about ear.
186, adult ♂, colors in life, abdominal patches ~~pale~~ powder-blue darkening medially. Pale blue suffusion over entire gular area. Above blue of abdomen yellow-green. Bright yellow green central spots in scales of lateral tan stripes, tourquoise on tail where not regenerated. Vertebral stripe brown-gray with slate-blue touch. Next lateral buffy tan stripes. Iris gold.

W. Riemer
1949

Scelo. poms jarrovii

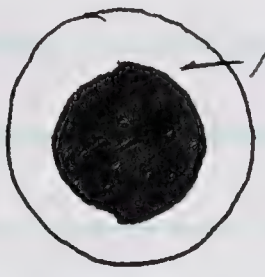
22 July Arizona, Cochise Co., Huachuca Mts, Carr Canyon
Series taken in various levels & canyon. Found occupying boulders, rock piles, logs on ground, wooden bridges and one taken on ground though rocks near by. Day overcast heavily. Lizards active but not very wary. Can easily be approached but very wary of noose not permitting it to be slipped of over head. Body temp. of adult 25.0° c taken at 1400 hours.
#364, colors in life, adult ♀, animal about to shed except tail where old skin pulled away. Venter grayish-pinkish-white medially. Dull, indistinct, powder-blue laterally on venter extending from limb to limb and in gular and throat areas back as far as insertion of forelimbs and anterior to level of eyes. Ventral surface tail pinkish-cream. Top of head (large plates) jet black, rest of dorsum of body and head sooty blackish brown. Many of ~~dorsal~~ body ~~dorsal~~ scales ~~dorsally~~ with central light spot of tarnish white especially those laterally placed to vertebral area. Dorsal surface tail blue with much black invading. Laterally for 2 inches from base a blue with light gray.

W. Riemer
1949

Sceloporus jarrovii

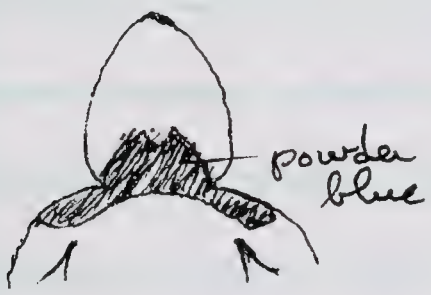
22 July Arizona, Cochise Co., Huachuca Mts, Carr Canyon

(# 364 cont'd) Collar not evident except laterally on shoulder. Light lines through and below eye cream with touch of pale yellow green below eye and behind nostril. Orange mites concentrated in rictal



at eye and. →

365, colors in life, young ♀; venter of body bluish white with strong golden luster, venter of head with pinkish gold luster anteriorly, powder blue gular patch. Abdominal blue limited to few lateral scales in groin. Venter of tail golden buff.



Top of head brown with very light green; dorsal ground color of body reddish-golden brown, with lighter and darker irregularly placed specks. Blue of gular grades into black on shoulder but collar not otherwise in evidence except for cream transverse band broken in mid line. Iris gold.

Other young similar except black collar evident and bordered anteriorly and posteriorly by light margin.

W. Riemer
1953

Sceloporus jarrovi

29 June Mexico: Chihuahua: 7 mi. SW El Vergel (= Baquivita), 7800 ft.

Series of 12, including 3 young taken in short while in morning. Common on logs and rocks both on dry pine forest slopes and in river bottom. Several young taken from under rocks and boards on wet soil at very edge of stream. Post-larval toads ~~also~~ abundant under same cover. # 1904 with powder blue lateral belly patches with deep blue in groin and ventrally on neck. # 1905 with bluish gray belly patches, blackish blue in groin, neck ventrally blue-green and this extending over gular area as greenish gray.

1 July # 1973. Ventrally has blue across throat and tiny patch below each groin. Most lack throat blue.

12 July Mexico: Sinaloa: 10 mi. by road NE El Batel, 6400 ft.

Two large adults taken on logs in canyon bottom, # 2105, 2106. Ventrally each with large blue gular patch with pale blue peripherally in 2105 and pale lemon peripherally in 2106. Each with ventrolateral pale blue belly patches, rest of venter bluish gray in 2105, white in 2106.

11 July Mexico: Sinaloa: 17 mi. by road NE El Batel

2103. Large blue gular patch changing rapidly to pale yellow green anteriorly. Laterally on belly are green-blue patches (small) changing to blue near groin. Rest of venter white with silver, yellow-green tinge.

W. Riemer
1949

Sceloporus magister

1 July Utah, Washington Co., Virgin River, 2.6 mi. SW Springdale # 206, adult ♀, taken 10 ft. up in willow(?) tree at edge of artificial irrigation ditch. Entire tree in shade but body temperature 38.0° C. Riparian growth but rocky desert surrounding. Abdominal patches very pale blue-green, almost suffusion over entire ventral surface. Under surface tail anteriorly yellow with touch of green. Gular area salmon suffusion. Lateral body wall with scattered yellow to green scales, many edged proximally with bright salmon. Most of anterior ⅓ tail scales with yellow, touch of salmon dorsally. Neck and head largely salmon-orange. Colors from specimen dead 20 hours.

W. Riemer
1948

Sceloporus occidentalis

Tenaya Canyon, 2.0 mi. above Mirror Lake, 4950 ft., Mariposa Co., Calif.

2 July Single individual, #86, taken in semi-shaded, large-block talus. Of several individuals observed, all occurred only on the granite rocks. This animal, a large ♂, very dark on dorsal and ventral surfaces. Though definitely *bisseriatus* thought to be intergrading into *tayloi*. Individuals appear widely scattered and not a all common in area.

W. Riemer
1947
1948

Sceloporus o. occidentalis

Subway Caves, Shasta Co., Calif

9 Aug. These animals almost twice as large as S. o. gracilis and more colorfully marked. Protective coloration not as effective as that of gracilis in Chaos Jumbles area of Lassen Park. Habitat: Rather dense manzanita broken by lava rock out-cropping and occasional P. ponderosa. Lizards mostly seen on rocks. S. gracilis also taken in same area. Species is not as wary of noose as g. gracilis making capture much easier. Common. 5 taken in about 20 minutes.

1948

Berkeley Hills, Alameda Co., Calif.

17 Feb. First Sceloporus of season seen sunning on old timbers at head of Hamilton Gulch. One adult; one juvenile. Weather: Cool and but intermittantly sunny. Habitat: Chapparal on lower side of road, sparsely vegetated road cut on other.

26 Apr. Site for study of this species daily activity movements and area,

J. Riemer
1948

Sceloporus o. occidentalis

26 Apr. Berkeley Hills, Alameda Co., Calif.
selected as top of west-most hilltop of Skyline Ridge or hilltop at head of Hamilton Gulch. Specimen #1 captured, outermost toe of right fore foot removed, dorsal side of four limbs painted orange with colored pencil. Specimen, an adult ♂, released at point of capture. Specimen #2, adult ♂, marked by removing second toe from right of right fore foot and painting limbs yellow and released. Specimen #3, subadult ♂, 3rd toe right fore foot removed, limbs painted green, released. #4, 4th toe right fore foot, painted blue; a subadult ♂ ~~(?)~~. #5, subadult ♀, 5th toe right fore-foot removed, painted red. #5 has just shed, the head still retaining old skin. Two other individuals seen; 1 subadult, ? sex; 1 very large, plump ♀. Neither marked. Exact location of captures not recorded for each animal since all greatly disturbed by mapping procedure. The two adult ♂'s and adult ♀ were seen over much of mapped area during afternoon indicating wide area of activity. Map area, including all habitat deemed suitable for Sceloporus, in 30 pace square. See map following. Area contains scattered ~~Baccharis~~ Baccharis,

v. Riemer 1948 Scelopous o. occidentalis

26 Apr. Berkeley Hills, Alameda Co., Calif.
clumps of thistle, green grasses of various sorts. The thistles are not higher than the higher grasses. Many small spots of bare ground on weak grass. These features not shown on map. Piles of lumber, pieces of roofing paper, large bare spots and other features shown on map. Large Coluber lateralis captured in area.

30 Apr. 1700 Subadult ♂, #6, captured, marked by removing innermost toe left forefoot and painting with purple.

1 May 1615 Purple sunning, at point of capture yesterday. Resting on tarpaper. Sunny tho not very warm. Moved three feet onto board, very rapidly as if after prey. Lady bird ~~beet~~ beetle passed within inch of snout, did not react. Have eaten that food in captivity. Yellow (?) 1630 sunning. Orange 1632 sunning same spot Purple left 10 minutes ago. Both on tar paper. Orange 1636 moved six feet. Orange 1649 moved 2 feet. Orange at 1655 was back at point just removed from. 1658 Purple reappeared at point disappeared. Orange 1700 removed to better sunning position. Lady-bird beetle ~~crawled~~ crawled all about in front of snout of Orange but derived no response.

O. Rieman
1948

Scelo porus o. occidentalis

Berkeley Hills Alameda Co. Calif.

1 May C

Purple disappeared almost as soon as appeared last. 1707 Orange disappeared. 1710 Yellow frightened. Disappeared almost immediately. Weather: intermittently cool and warm as sun obscured by scattered clouds. 1730 new individual captured and marked by removing 4th from outer toe left forefoot, painting forelimbs green, hind limbs red; to be called Green-red or G.R. A subadult ♀. 1755 rather cold past half hour and no activity seen, presumably finished for day. Sun no longer high enough to heat substrate. All boards and tar paper cool to touch. Observations ceased.

5 May C

See several following pages for details of individuals movements. Observations in study area begun 0825. Weather: warm, bright, clear, with heavy haze near horizon. No clouds, no wind. Animals had apparently emerged sometime before observations begun. Thamnophis ordinoides atratus captured 0900 in area probably of no significant note to problem. Not known to be predator, and size small. Impression that subadults tend to remain within confined areas while at least ♂ adults occupy all parts of area. Also noted that animals tend to rest in semi-sun, i.e. blotched sun and shade

(this date)

W. Kramer 1948

Sceloporus o. occidentalis

-5-

5 May Berkeley Hills, Alameda Co., Calif.

	Specimen	Distance moved	New substrate Wood	Tarpaper	Other	To Sun	Shade	Temperature Air	Substrate
0825	Purple	already out when observation began		X		X			
0830								64°F	
	♂ subadult	captured and marked with removal middle toe							
0845	Orange tail		X		left fore foot, tail painted orange				
0855	Green & red			X		X			
0900	Thamnophis ordinoides atratus captured W edge bare area.								
0905	~~Blue~~ Green			X		X			
0907	Orange		X			X			
0910	"	4 ft.	X			X			
0916	"	6 ft	X			X			
0917	"	3 ft							
0925	"	9 ft	X			X			
0926	"	3 ft	X		and disappeared				
0930	~~Blue~~ Green	same spot as before		X		X			
0935	Red ♀ adult	captured & marked with red stripe down spine			18" of gravel covered in dead leaves	X			
0945	Red-back	2nd from outer toe left forefoot already removed. Very plump as if full of eggs.							
0946	Green & Red		X			X			
1010	Purple			X		X			
1015	Orange ♀ adult	Very plump as if full of eggs.	X			X			Outer toe left fore foot removed Blue stripe painted down spine
1030	Blue-back				Earth	X			
1030	~~Blue~~ Green	Chasing Blue-back				X			
1035	Orange	10 ft			Earth	X			Remained 30 minutes in direct sun without moving
1055	Yellow & ~~Blue~~ Green	10 ft	X		"	X			Chased ~~Blue~~ Green
"	~~Blue~~	6 ft			"	X			
1101	"	3 ft	X			X			
1108	"	5 ft	X			X			
"	Orange	12 ft	Dashed after ~~Yellow~~ Green						
"	Yellow	6 ft	Emerged to chase off Orange						
1110	~~Blue~~ Green	3 ft	Dashed off at			return		off Yellow	

Item 1
1948

Sceloporus o. occidentalis

6.7

5 May

Berkeley Hills, Alameda Co., Calif.

Specimen	Distance moved	New substrate: Wood	Tarpaper	Other	To: Sun	Shade	Temperature: Air	Substrate	
1125							72.5°F		
1131	Red		X		X				
1140	Purple		X			X			
1150	Yellow	X				X			
1153	Red			Charcoal	X				
1155	Red-back		X		X				
1157	Green-red		X		X				
1200	Purple		X			X	Observation suspended		
1250	Orange	on fence post, 12 paces E of E border of area — Shows mild intimidation of another adult on same post.					Observation resumed.		
	Quite actively moving about and appears to be feeding.								
1307	"	6 ft	X		X				
1310	"	3 ft	X		X		chased other unmarked lizards		
1311	"	2 ft	X		X				
1313	"	4 ft	X			X			
1315	"	5 ft	X		X				
1333	"	Disappeared							
1344	"	6 ft	X		X				
1347	"	4 ft	X		X				
1350	"	6 ft	X		X		Remained motionless in direct sun		
1406	"	8 ft	X		X				
1410	"	10 ft	X		X				
1415	"	10 ft			Earth		Drop to ground from top of fence post & started thru grass direction of arrow (see map)		
1417	Searching for Orange, frightened back to post								
1437	"	15 ft	X			X	Moved to new post		
1441	"								
1441	Disappeared								
1500	Red-tail	♂ subadult captured, inter-toe right hind-toe removed, tail painted red. (Earth)							
1511	~~Blue~~ green		X		X				
1517	Blue			X	X		Observation suspended		

(all Blues except last should be Green)

J. Kiemer
1948

Sceloporus o. occidentalis

5 May — Berkeley Hills, Alameda Co., Calif.

	Specimen	Distance moved	New Substrate: Wood	Tarpaper	Other	To: Sun	Shade	Temperature: Air	Substrate	
1545								73°F		
1600	Red-back			X		X				observation resumed.
1602	Yellow-back	Captured ♂ subadult		second from outer toe			right hind foot removed, paint tail painted yellow			
1610	Orange tail			X		X				
1615	Orange		X			X				
1616	" ♂ subadult	6 ft Captured	X			X				
1618	Yellow-tail			middle toe removed			X	right hind foot, painted tail yellow		
1618	Green-red			X		X				
1625	Red-tail			X		X				
1628	Yellow		X			X				
1628	Green		X			X				
1630	Orange				Rock	X				observation suspended
12 May										
0900	Blue-back		X			X				
0900	Green			X		X				
0907	Green-red		X			X				
0907	Yellow-tail			X		X				
0907	Yellow			X		X				
0915	Red		X			X				
0918	Green back		X			X		Has not moved		
0920	Blue-#.		X			X		Has not moved		
0925	Purple confirmed as subadult ♂	Had shed. Recaptured & repainted tan				X				
0945	Blue	Had shed. Recaptured & repainted. Tail recently broken	X			X		no growth apparent.		
1002	Yellow			X		X				
1002	Yellow-tail			X		X		Same spot as above.		
1020	Red tail	Had shed only on tail. Recaptured & repainted	X			X				
1020	Green		X			X		Has not moved		
1033	Purple			X		X				
1036	Red-back		X			X				

Sceloporus o. occidentalis

5 May Berkeley Hills, Alameda Co., Calif.

rather than direct sun. As heat of day increases sites of running tend to increase in shadiness and diminish in sun. One male adult remained 30 minutes in full sun and direct sun without moving. None noted in complete shade. Of two large ♀'s handled both extremely plump as if full of eggs. 1500-1530 noted that very few individuals could be found. Heat apparently not intense enough to cause others close by, but outside of area, to retreat to cover. Apparently fewer ♀'s in area than ♂'s. Seems unusual number of subadult ♂. At present 2 adult ♀'s, 2 adult ♂'s; 2 subadult ♀'s, 7 subadult ♂'s. No preference detectable in use of tarpaper or wood as substrate. Both used freely. Greater number of wood selections in days recording because most of observations in areas without tarpaper. Note extensive movements of Orange, in effect making a complete circle of area during day. Weather: about 1500 light intermittent breezes arose, otherwise as in morning, horizon haze continuing. ~~Other species noted~~: Microtus c. californicus running about thru grass and feeding throughout day though especially in morning. Often approached or passed within

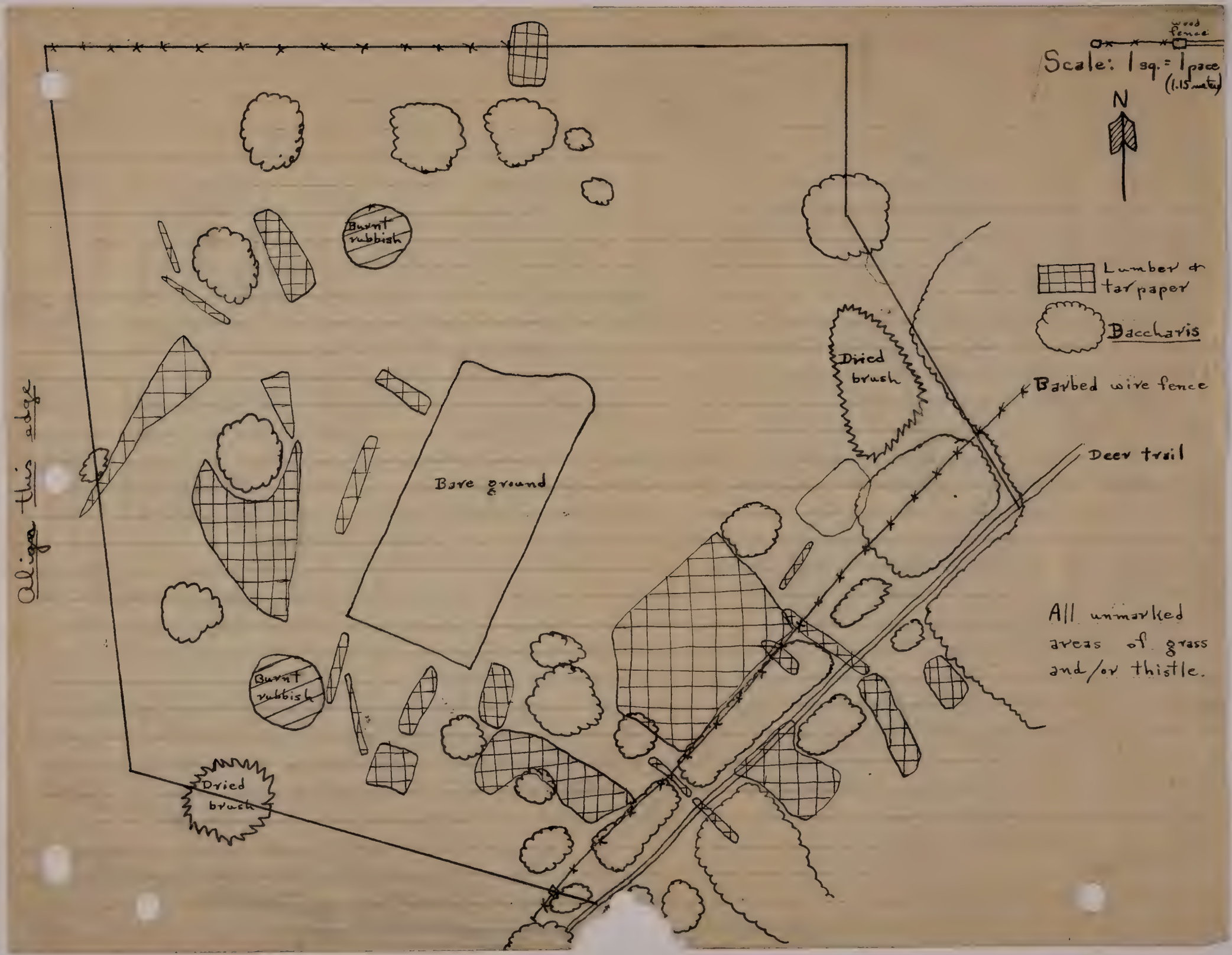
5 May Berkeley Hills, Alameda Co., Calif.
six inches of Scelopous without disturbing them.

12 May Yesterday, 11 May, clear, warm, sunny all day. Animals presumed to have had normal day and activity not interfered with by weather. Observation begun 0840. At time, overcast, cold, light breezes. Sun first out at 0900. 0915 substratum warm, air cold, sun intermittant. 0940 air warming, overcast breaking. 1030 clear, cool, sunny, light breezes. 1100 cold, overcasting again. 1200 cool, clear, sunny, light breezes. 1320 warm. 1330 tho not hot animals seem very scarce. 1445 cool again. Observation discontinued @ 1545. At 1005 one, half-grown Coluber constrictor mormon, a predator of species, seen at location Blue captured. 1100 a lone feral house cat seen in area. All specimens previously marked seen today except Orange + Orange-bil. Could extensive wanderings of Orange indicate a search for better territory? Or could it be that the orange color attracted predators more easily. Large area surrounding study area searched but no trace of critter found. No extensive movements among others today. Two new individuals marked.

W. J. Riemer
1948

Sceloporus o. occidentalis

Maps


Wood fence
Scale: 1 sq. = 1 pace (1.15 metre)
N
Burnt rubbish
Lumber & tar paper
Baccharis
Dried brush
Barbed wire fence
Deer trail
Bare ground
Align this edge
All unmarked areas of grass and/or thistle.
Burnt rubbish
Dried brush

W. Riemer
1948
1 May

Scelopoma o. occidentalis

10.5

Align this edge

2.

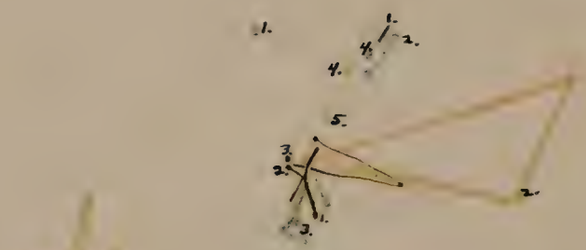
1.

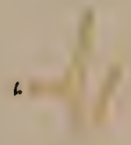
1.

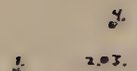
W. Riemer
1948
5 May

Scelopous o. occidentalis

Align this edge







W. Riemer
1948
12 May

Scelopoms •. occidentalis

Align this edge

W. Rieman
1948

17 May

Scelopoma o. occidentalis

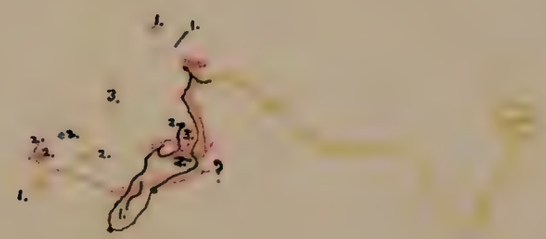
align this edge

W. Riemer
1948

22 May

Sceloporus o. occidentalis

Align this edge



Sceloporus o. occidentalis

12 May — Berkeley Hills, Alameda Co., Calif.

	Specimen	Distance moved	New substrate: Wood	Tarpaper	Other	To: Sun	Shade	Temperature: Air	Substrate	
1103	Yellow	4 ft. as	Red-back		frightened		toward	him.		
1103	Red-back			X		X		Had not moved		
1110	Yellow-back			X		X				
1115	Yellow-tail		X			X				
1116	Blue		X			X				
1120	Red-tail		X			X				
1122	Green		X			X				
1122	Blue-back				Earth	X				
1141	Red-back			X		X		Had returned to same spot after being frighten		
1144	Green-red		X			X				
1146	Blue			X		=	X	Had not moved		
1152	Blue-back		X			X	=			
1152	Green		=		Earth	X				
1302	Blue-back		X			X		Has not moved		
1304	Green Subadult ♂		X			X		Has not moved		
1310	Green-tail	Captured & marked by removing 4th		X		X		from outer toe right hind foot. Tail painted green		
1325	Blue-tail Subadult ♀	captured & marked by removing	X			X		inner toe right hind foot. Tail painted blue		
1335	Green-red			X		X		Obsevation suspended		
1448	Yellow-tail			X		X		"	resumed	
1450	Green-red			X		X				
1451	Blue		X			X				
1457	Green				Earth	X				
1458	Blue-back				Earth		X			
1505	Green-tail			X		X				
1507	Blue-tail		X			X				
1517	Blue-back				Earth	X				
1524	"	18 in.	X			X				
1533	Purple			X		X				
1538	Red-back		X			X		Obsevation suspended		

Sceloporus o. occidentalis

17 May Head of Hamilton Gulch, Berkeley Hills, Berkeley, Alameda Co., Calif.

	Specimen	Distance moved	
1410	Observation begun.		
1415	Orange-back	New individual. Captured painted; inner toe left hind foot removed. Adult ♂	
1415	Purple legs		
1437	Yellow legs		
1437	Red-back		
1441	Red-tail		
1452	Yellow-back		
1454	Blue legs		
1458	Yellow-legs	Same spot as above.	
1459	"	18 in.	Bobbed slowly 2-3 times. Contined in very short crawls forward distance of 3 ft. from grey to red surface of tarpaper. Apparently makes few ~~bobbs~~ bobs after each forward movement. Such bobbing done in lazy manner and without compressing body. Substrate warm, air cool, animal in semishade
1517	Red-back	6 ft.	
1517	Blue legs	6 ft.	Apparently chasing Red-back
1526	Purple legs		
1540	Red-back	Disappeared. Has become quite cool and cloudy	
1541	Orange-back	Disappeared.	
1544	Yellow legs	7 ft.	
1545	Red back	10 ft.	No apparent notice taken of one another.
1550	Orangeback		
1555	Purple legs	4 ft.	
1507	Blue legs	6 ft.	Then dashed out of view at approach
1507+	Yellow legs	10 ft.	of Yellowlegs. Yellowlegs first explored spot under tarpaper where Blue legs had been, then moved over

17 May Head of Hamilton Gulch, Berkeley Hills, Berkeley + Alameda Co., Calif.

	Specimen	Distance moved	
			indicated route by short crawls during ~~next~~ next two minutes.
1623	Yellow-tail		
1625	Blue-tail		
1627	Yellow-legs	2 ft.	
1629	"		began to eat a caterpillar, after a moment left it, moved another 2 ft. and again 2 ft., all during 2 minutes.
1636	"	15 ft.	This move took 4 full minutes. Progress in short jerky crawls.
1645	Blue-tail	6 ft.	
1650	Yellow-legs		all track of time in relation to movements lost. Continued to move in short dashes, often exploring crevices under boards & paper, running momentarily, following a path seemingly well known, until last time designation.
1656	"	18 ft.	in short crawls + dashes
1700	"		chased another animal (probably Yellow-back) 3 ft., moved into sun 2 ft. away. Quite cool and windy though sunny.
1712	"	8 ft.	
1715	~~Red~~ Orange-back		May have been frightened by my approach.
1720	"	8 ft.	
1715	Yellow-back		
1727	Orange-back	16 ft.+	Disappeared.
1735	"		
1745	Blue-back		Observation suspended.

17 May Head Hamilton Gulch, Berkeley Hills, Berkeley, Alameda Co., Calif. Weather generally cool to cold, intermittently sunny, moderately cloudy, moderate winds. Despite of coolness substratum warm and species active. As end of period of activity approached movements of animals greatly increased. Examination of crevices and similar hiding places made by Yellow-legs during last, frial, extensive movement. Specimen seemed to be well acquainted with ground covered. Perhaps such extensive movements serve only to return animal to usual overnighting spot, if such exists. By time animals retired substrate had lost most of heat. Noted that many of the animals moved into shaded area near close of activity instead of into spots still partially warmed by sun.

22 May Seen in study area thus far have been two Coluber lateralis and three (?) C. constrictor mormon. The first lateralis and last two mormon captured; the mormons, this date. One of mormons actually pursuing a Scelopous when captured. Species apparently recognizes this

W. Riemer
1948

Sceloporus o. occidentalis 18.

Head of Hamilton Gulch, Berkeley Hills, Berkeley
22 May Alameda Co., Calif.

	Specimen	Distance moved
1400	Observation begun	
1409	Yellow-tail	
1417	Red-backs	
1425	Purple-legs	
1431	Orange-back	13 paces beyond upper right hand corner of map and in prolongation of upper edge of paper. On fencepost.
1448	Purple-legs	In same spot.
1453	Red-back	In same spot. Frightened away
1455	Blue-legs	Frightened away
1503	Red-tail	
1505	Green legs	
1515	Orange back	On same post
1525	Placed ♀ adult from distant fence post on post with Orange-back, a ♂. Guided ♂ to within few inches of ♀. Interest in me predominent for few moments. Then with stuttering, quivering crawl moved up behind ♀. ♀ ran few steps, ♂ followed in few moments. As long as ♀ remained out of sight ♂ appeared not to notice her presence. Again cooxed together. ♂ rapidly bobbled head immediately in front of hers and gently nipped at loose skin of her neck. ♀ slipped a few steps away. ♂ made no more immediate overtures tho ♀ in plain view. Slowly walked toward ♀. At 4 inches distance again began quivering crawl. ♀ ran off short distance.	
1550		

Sceloporus o. occidentalis

Head Hamilton Gulch, Berkeley Hills, Berkeley,
22 May Alameda Co., Calif.

Specimen		Distance moved
1555	Purple-legs	At same spot.
1610	Green-red	Had shed. Captured and repainted.
1621	Blue-legs	
1622	Yellow-tail	
1625	Red-legs	atop fence post
1630	Green-legs	
1633	Orange-back legs	♂ and ♀ introduced still following former pattern. Twice within 2 minutes ♀ approach with quivering crawl. ♀ ran off both times. ♂ seems to want to work his head around to her neck region in approach
1643	Blue-back	
1643	Red-back	lying immediately adjacent to one another.
1643	Green-red	
1645	Red-back	Made several short, rapid oscillating dashes with few second pause at end of each. Very excited. Then Coluber c. mormon (about 24" long) chased after animal for 18", though not rapidly. Had emerged from under tar paper less than two feet from where Coluber lateralis seen ~~earlier~~ earlier in afternoon. Snake was captured.
1702	Yellow-legs	
1705	Red-legs	Same spot as above.
1710	Red-back	Moved to within 12 inches of Yellow-legs. After few moments Yellow-legs, a ♂, with quivering crawl approached. When

Head of Hamilton Gulch, Berkeley Hills, Berkeley,
22 May Alameda Co., Calif. approached Red-back, ♂ ♀ ran off, and continued movement, though presumably not as a rejection of ♂, after a few seconds. ♂ followed but a short distance.

Specimen	Distance moved	
1724	Blue-back	At same spot.
1725	Yellow-legs and Red-back	together (3" apart) but paying no attention to eachother.
1728	Yellow-tail	
1732	Yellow-legs	arouses Red-back and follows tip of her tail in quivering gait about 3 feet. Bobs at each pause.
1735	"	Moved back to original spot. Seen to eat a black (large) ant.
1740	"	4 ft. back toward (3 ft from) Red back.
1740	Blue back	a ♀ Approach by Yellow legs after another try at Red-back. Blue-back arched back danced in bouncing manner in small semi-circle about ♂. Both remained next to each other several minutes.
1745	Yellow legs	5 ft.
1747	~~Blue~~ Red-back	5 ft followed Yellow-legs.
1800	Yellow legs	6 ft.
1805	"	25 ft. With momentary stops.
1807	"	Crawled into crevice in tarpaper. Tarpaper very cool to touch.
1815	Blue-back	At same spot as before
1826	"	6 ft. Crawled into crevice in tarpaper.
1827	Air temperature 17° C	
1832	Green-legs	
1837	Orange back	and introduced ♀ still on same post
1838	Observations suspended.	

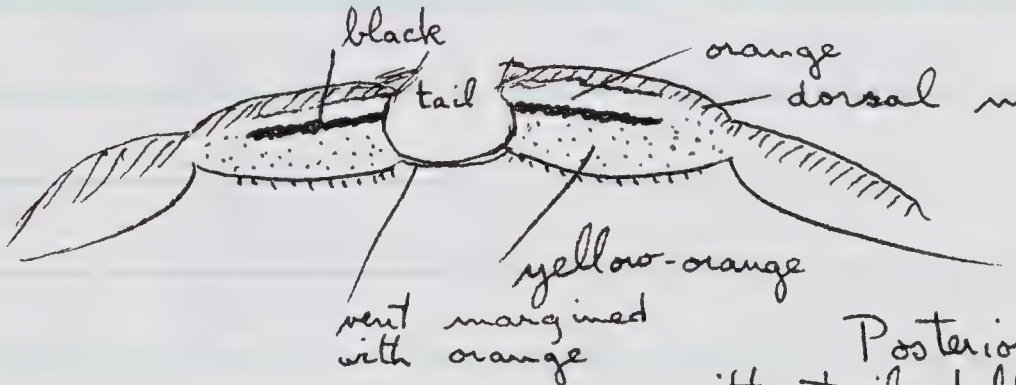
22 May Head of Hamilton Gulch, Berkeley Hills Berkeley
Alameda Co., Calif. species of snakes as an enemy since excitment of attacked Sceloporus profound. Perhaps any snake-like form may elicite same response. There is difference in ease of noosing species when noose made of black and white fish line and when of white thread. Visibility thought to be one factor against fish line, though pattern of black and white would seem to break noose outline. Also extra thickness or stiffness may be disadvantage of fish line. Great difficulty experienced in noosing today, which in conjunction with fish line may be caused by heat. Animals exceedingly wary. During all observations noted that only infrequent use of plant stalks and branches and then only in moving from place to place. One exception, in which Red-legs sunned for long period on dried stalk of Baccharis horizontal to and but few inches from ground. Never have they been seen climbing in a bush though a favorite spot where available are fence posts. Yellow-legs seems to show preferance for a favorite shelter spot at night. Additional observations

22 May — Head of Hamilton Gulch, Berkeley Hills, Berkeley Alameda Co., Calif. - necessary to confirm this point. At this time, appears that Yellow-legs leaves shelter spot when weather conditions suitable, wanders over territory as caprice (?) dictates, and as long and far as the weather conditions of the day permit. As sun declines and coolness reaches critical point animal returns rapidly and rather directly to favorite shelter. Essential in such a case that the animal be well acquainted with surrounding region so as to return so surely. Interestingly Yellow-legs does not follow sunny patches over narrow crest of hilltop onto west facing slope where substratum still warm but when about a half hour of sun still remains at favorite area of activity, retires down east facing slope into shade, to retire in spot not touched by sun for perhaps a half hour and therefore cooler than place just left. Perhaps such behavior permits an earlier morning start since tarpaper selected must be exposed to very first morning rays of sun. All do not seem to react in this manner!

W. Riemer
1949

Sceloporus occidentalis

19 June Mojave River, 3 mi. N Victorville, San Bernardino Co., Calif. # 106, ♀, taken 9 ft. above ground on trunk of leguminous (?) tree. Appears gravid. Ventral color patches only faintly suggested on abdomen and small torquoise patch on throat. Impressed by lack of ventral color. Attracted to specimen by nuptial colors (?) as follows. Axilla with orange patch grading to yellow on ventral surface upper arm at elbow. Scattered ventro-lateral scales tipped with orange. Posterior surface of femur also with yellow and orange area.



Posterior aspect with tail deflected upward

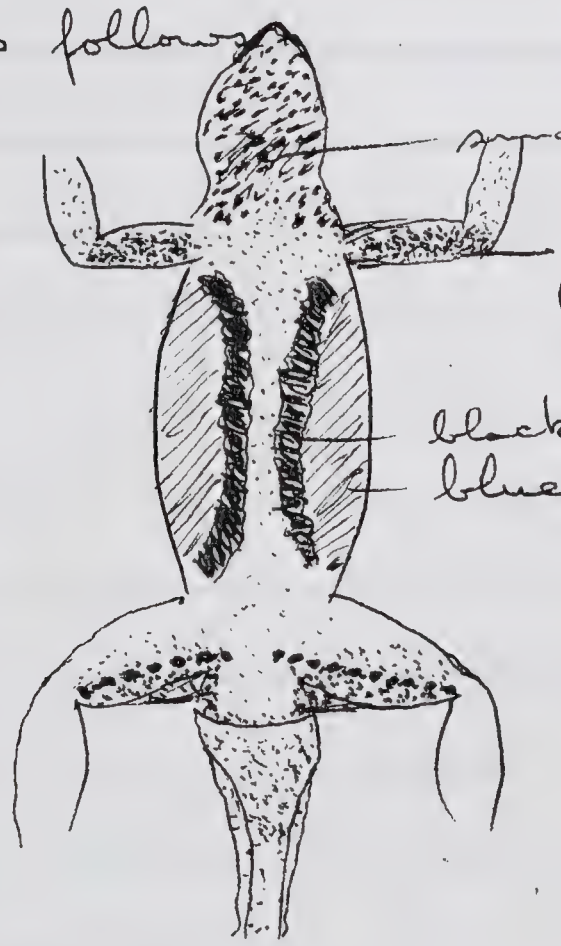
Patch on femur sharply limited by femoral pores, knee, dorsal color margin and base of thigh except narrow strip more intense orange margining vent. Under side anterior portion tail suffused with light orange. Small patch yellow-orange in granular scales of rictal fold. Also hint of orange on upper eyelid.

W. Riemer
1949

Sceloporus occidentalis

22 June 34.2 mi. NE Warm Springs, U.S. Hwy 6, Nye Co., Nevada 3 taken while sunning atop highest points of rocky pinnacles. Intermittent overcast, cool, body temp. of two 34.2°C and 32.8°C. Rocky canyon situation with low sagebrush. Crotaphytus collaris present in numbers and occupying similiar rocky points. Not seen on same rocky piles however.

134, ♂ (enlarged post-anal scales) with pigment as follows



Iris - pale gold

22 June Nevada, Nye Co., Currant

4 adults taken. Overcast and cool. Animals easily taken. At edge of irrigated wheat field and typical desert.

a

W. Riemer
1950
1951

Scaloporus occidentalis

7 Aug. Calif.: Contra Costa Co., Mt. Diablo At very summit of peak, 3850 ft., saw one young of year of this species. Apparently born some time ago since appeared larger than my impression of newborns. Adults present but not common. Warm, sunny and clear

1951
18 Aug. Calif.: Sonoma Co., 1 mi. W, ½ mi. N Skaggs Springs, Warm Springs Creek
Small Scaloporus common near stream. Apparently hatched only recently. No adults seen. None collected.

W. Reimer
1952

Sceloporus occidentalis

3 Feb. Calif.: Mendocino Co., 9.4 mi. SSE Willets

Single juvenile taken 2½ feet above ground under bark of dead upright tree. See Ameides lugubris account. Animal completely inactive, wet.

W. Riemer
1953

Sceloporus poinsettii

26 June Mexico: Chihuahua: 1.6 mi. W Padernales

2 young taken from under rocks on hill slope in scrawny pine-oak forest. Adults taken in crevices of adobe walls. Many crevices with mummies. Speculate that lizards entered cracks, rain came to swell bricks and trap lizards which then starved to death. Those taken in walls were taken after dark. Adults with reddish-orange or salmon around eye, ear aperture, postero-ventral portion of thigh, ventral surface at base of tail, ventro-laterally on belly, also a few flecks above insertion of forelimb. Young with metallic orangish also on dorsum.

W. Riemer
1953

Sceloporus poinsetti

1 July 1953 Mexico: Chihuahua: 7 mi. SW El Vergel (=Lagunita), 7800 ft.

#1977 Colors from life. Ventral aspect.

Dorsally on anterior half of trunk are several scales tipped with orange. Ear and eye opening are surrounded with reddish orange. A single bright blue scale is present in middle of black collar just anterior to forelimb insertion.

W. Reiner
1949

Scelo porus undulatus

29 June Utah, Garfield Co., 12.5 mi. SSW Junction, U.S. Hwy 89. # 181, adult ♂, abdominal blue tourquoise blue laterally grading darker medially. Small medium blue patch ventro-medially from ear. Suggestion of yellowish on femoral pores and about vent. Dorsal light areas brownish gray. Body temperature 35.0° C at 1610. Not very wary.

30 June Utah, Kane Co., 0.2 mi. N Glendale, Rt. 5. Hwy 89 ~~Adult ♀~~, See S. gracious this date for description of habitat. Body temp. 34.6°, 34.9°C. # 192, adult ♀, colors in life, abdominal patches powder blue, also those gular patches below ear. Very pale blue in rictal. Interspaces of dorsum pale tan-yellow. Iris red-copper. # 191, young ♀, colors in life, abdominal patches pale powder-blue, also gular patches. Rictal blue-gray. Interspaces of dorsum buffy-tan-gray. Iris, gold.

1 July Utah, Washington Co., Virgin River, 2.6 mi. SW Springdale. # 205, adult ♀, abdominal patches tourquoise darkening medially. Gular patches and rictal same as blue most medially. Upper lids and supraciliaries salmon especially bright on latter. Dorsum buffy pink

W. Reimer
1949

Sceloporus undulatus

1 July — Utah, Washington Co., Virgin River, 2.6 mi. SW Springdale (#205 cont'd) and pale without any distinct markings. ~~Tipped~~ Few scales laterally at base of tail tipped with salmon orange. All colors from life.
#204, young ♂, taken on pink rock 6 ft. from wide stream. Light leaf litter, willows(?), and cottonwoods. Sand substrate. Temp. of body 35.3° C. Color in life same as preceding except abdominal and gular blue not so intense, orange lacking about eye, dorsal pattern fairly distinct the principal range being brown or black-brown, interspaces light-gray brown, and buffy gray.

89

28 July — Arizona, Coconino Co., 8 mi. SSW Flagstaff, U.S. Alt. Hwy 1
Taken as emerging from hole in dead yellow pine, 2 ½ ft. above ground. Not wary. Body temp. 33.3° C, about 1000 hours.
#399, adult ♀, colors in life; light dorsolateral stripes buffy tan, vertebral stripe brownish-gray with tinge of blue. Bordering light stripe area of tan-brown. Transverse bars, deep dark brown.

28 July — Arizona, Navajo Co., 1.5 mi. N Lakeside
Taken by hand about 2100 hours in grass at edge of trail. Apparently frightened from under rock along or in trail.

W. Reiner
1949

Sceloporus undulatus

28 July Arizona, Navajo Co., 1.5 mi. N Lakeside

401, adult ♂, colors in life; abdominal patches turquoise to blue darkening medially. Medial border of black. Gular patches same colors darkening anteriorly. Black border posterior edge. Rest of venter white with pink luster. Vertebral stripe gray with brown, next lateral dark tan, light stripe of cream specks bordered ventrally by dark chocolate. Iris greenish gold. Mites concentrated in rictal, also on upper lid.

13 Aug. New Mexico, Bernalillo Co., 6 mi. NNE Tijera, State Hwy 10

Specimen roosted 1530 hours on rock and mud wall of ruins of old building. Intermittently sunny and overcast, body temp. 36.3° C. Short grass and low "burnweed" plus other annuals. Juniper and cholla but not in immediate vicinity. Animal with green stains in mental region. Is this result of eating plant food or a caterpillar?

Another taken 15 ft. from above in same situation. Body temp. 35.8° C.

Others taken in same place with body temp. of 36.2° and 34.8° C. The latter when first seen on top of exposed rock of wall with mouth partly open.

W. Riemer
1949

Sceloporus undulatus

13 Aug. New Mexico, Bernalillo Co., 6 mi. NNE Tijera, State Hwy 10

Also had ~~go~~ green on post mentals.
Other ~~animals~~ common on soil far from rocks or other litter.

446, adult ♀, colors in life; very faint greenish represents abdominal patches. Powder-blue patches on throat no quite meeting in midline. Vertebral stripe tannish-gray, next laterally black with brown showing in indentations, next laterally buffy white stripe, next brown with black spots, then buffy white margined by black. Buffy white changes to yellow-tan on tail at base. Iris gold.

447, adult ♀, colors in life; venter with golden tinge, abdominal patches faint silvery-blue, patches on throat meeting in midline on a single scale, powder-blue to dark tourquoise anteromedially. Vertebral stripe dark grayish-olive-tan, next black and brown spots, next pale buff stripe, next olive-brown, next a weak buff stripe. Iris gold.

448, adult ♀, colors in life; abdominal patches pale greenish-blue, throat patches powder-blue meeting broadly in midline. Dorsally same as # 446 except stripes more broken and white spot between vertebral

W. Riemer
1949

Sceloporus undulatus

13 Aug. New Mexico, Bernalillo Co., 6 mi. NNE Tijera, State Hwy 10

stripe and adjacent black. Iris reddish copper.

17 Aug. Colorado, Las Animas Co., Sopris, State Hwy 238

Single specimen found under old cardboard carton in dump area just E of town. Pinon-juniper association. #460, adult ♀, colors in life; venter with pinkish hue, abdominal patches ~~with~~ pale grayish-blue. Gular region with pale orange cast, powder to darker blue patches meeting in midline by several heavily melanistic scales. Broad dorsal stripe of brownish-gray in which lie transverse bands of dark brown and black. Laterally a grayish dark tan. Iris bright yellow gold.

17 Aug. Colorado, Las Animas Co., 1.9 mi. SE Aguilar, U.S. Hwy 85-87

Single specimen taken between slabs of rock at edge of arroyo on short-grass prairie. 12"-18" yucca in scattered clumps. Locality close to foothills. Cholla present. Few rocks about. Body temp. 36.3°C. No other lizards seen in about half hour search.

#461, adult ♂, colors in life; venter white, abdominal patches pale blue to pale green-

W. Riemer
1949

Sceloporus undulatus

~~Journal~~

17 Aug. Colorado, has Animas Co., 1.9 mi. SE Aguilar, U.S. Hwy 85-87
blue laterally. Gular patches tourquoise meeting narrowly at midline. Rest of gular area with pale orange salmon cast especially anteriorly and laterally. Broad dorsal stripe, enclosing indistinct brown to black transverse bars, olive-brown. This margined laterally by poorly defined dark buffy stripe and in turn flanked laterally by an olive-brown stripe but slightly darker brown than dorsalmost stripe. Dorsally tail grayish buffy and unmarked. Iris gold.

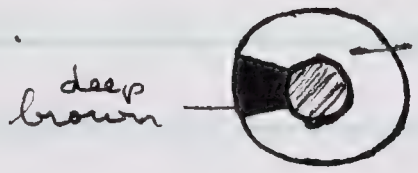
25 Aug. Colorado.
1045 hours, extremely large specimen taken by noose while sunning atop small boulder on rocky shelf above stream channel. Yellow green sagebrush-sized plant dominant. Arid treeless region. Low mountains. Weather hot and sunny. Body temp. 36.6° C. Not wary.
1145 hours, another large animal taken by noose while sunning atop boulder on arid grass and sage hillside. Body temp. 36.3° C. More wary than first animal but not especially so. Seems that animals much more wary if disturbed from original perch.

W. Riemer
1949

Sceloporus undulatus

25 Aug. Colorado, Delta Co., 14.6 mi. WNW Delta, U.S. Hwy 50

#485, adult ♀, colors in life; venter white with pinkish tinge. Abdominal patches powder blue and slightly darker medially and anteriorly. Gular patches slightly darker blue. Dorsal color gray brown with brown transverse bars on body. Scales immediately behind bars slightly paler than rest of ground color. No suggestion of longitudinal stripes. Dull orange patch 2-3 mm. square just above insertion right forelimb, unilateral. Iris yellow gold.



large fat bodies. rt. eye ant. ⇒ Is this storage for winter?

#486, adult ♂, colors in life; venter white with faint bluish cast. Abdominal patches powder-blue laterally to blue-gray medially. Gular patches blue-gray with small area of powder blue posteriorly. Dorsum gray ish-tan. Transverse bars as in #485. Suggestion of longitudinal stripe at ventral ends of bars. Iris gold and otherwise like #485

W. Reiner
1953

Sceloporus undulatus

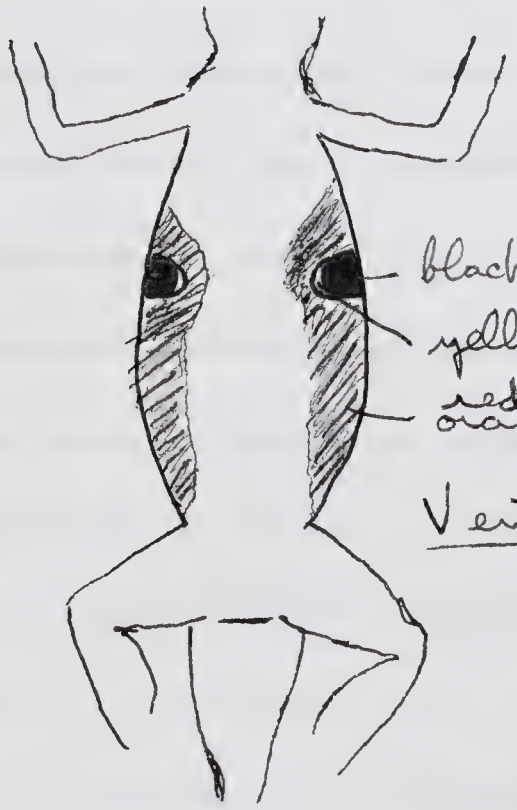
6 July — Mexico: Durango : Rio Nazas at San Salvador

5 taken, present on cottonwood trunks and logs near river bank and on mesquite away from river. Also present in rocks. 2 ♂♂ ♀♀ with ventral blue flecking, 1 with two posters - lateral pale blue-green throat patches. This same ♀ with orange on supraciliaries, rostral and internasals. Other large ♀ with yellow in these same areas. 1 ♂ with orange over top of head and snout including mental and infralabials. Ventrally ♂ with metallic greenish-blue on throat and ventro-laterally on ~~the~~ trunk, the latter patches margined with black medially.

W. Reimer
1949

Uma notata

10 July Calif., Imperial Co., 12.8 mi. W Winterhaven, U.S. Hwy 80.
4 specimens taken in sand dunes in early part of morning. Weather hot and clear. Extremely wary making shooting necessary in all cases.
260, ♀, colors in life.



Ventral aspect

Also small orange spot above axilla but well hidden by flowed limb. Also orange on all parts of eye lids which are concealed when closed. Suggestion of weak orange in gular area. 3 butterscotch spots hind side each thigh surrounded in part, mostly ventrally by rich cream. Dorsal reticulum orange-brown.
259, ♀, colors after dead about 6-7 hours. Same as # 260 except abdominal orange disappears rapidly forward of black spots and generally not so wide. Dorsal reticulum yellow-tan.

W. Riemer
1949

Uroscaurus gracilosus

8 July Arizona, Mohave Co., 13.1 mi. SW Kingman, U.S. Hwy 66 3 animals taken in creosote bushes. Temp. very hot and all resting on shaded side of limbs of about their diameter. All resting head down. 1 seen in terminal cluster of foliage in relatively shaded situation, running. When disturbed ran downward to larger limb and remained motionless. When attempted to grab with hand dropped to ground and ran off to base of another bush. Into a hole?

250, ♂, colors in life. Gular patch red-orange. Abdominal patches tourquoise centrally slightly darker anteriorly, slightly lighter posteriorly. Scales of abdominal patches not equally colored being scattered as to light and dark. Between transverse dark bands of dorsum are bands of yellow ~~tan~~-tan. From base of tail over lateral surfaces of proximal one-half is orange suffusion

249, ♀, colors in life. Entire venter unmarked. On tail no orange. Yellow-tan dorsal bands as in # 250

248, ♂, colos in life. Gular area very pale ~~mi~~yellow. Abdominal patches tourquoise as in # 250. Dorsal bands yellow-tan and tail suffusion of orange tan as in # 250.

W. Reiner
1949

Uroscaurus ornatus

12 July — Calif., Imperial Co, 1.1 mi. SE Winterhaven
Took Uroscaurus ♂ after long search in various localities on trunk of large flat-bean (?) mesquite tree near large canal. Associated with willows and screw-bean mesquite. Being found in such habitat makes hypothesis that graciosus and ornatus interbreed in Yuma area. I.e. graciosus thus far taken by party all from creosote but is said to occur in mesquite also. ~~Possib~~ Presumbably both could occur in same brush on occasion. Ornatus appears to be larger, heavier, more wary animal not relying so much on protective coloration. Oddly enough no ornatus seen in willows where rough bark would afford better concealment. Appear to take place of Sceloporus occidentalis or magister of west coast and southern Great Basin.

21 July — Arizona, Pima Co., Hdqtrs Santa Rita Experimental Range
Specimen taken on wooden stairs over fence at upper edge of Station area. Body temp. 26.6° C, 1100 hours. Neither active nor wary at this temp. and easily taken by hand. Apparently animal attempting to gather warmth at time but sun not out.

W. Riemer
1949

Uroscaurus ornatus

21 July Arizona, Pima Co., Hdqtrs Santa Rita Experimental Range
Heavy overcast. In immediate vicinity only mesquite and prickly pear and various grasses and low herbage. Oaks nearby. Gular patch at time of capture lemon yellow and dorsum almost pattern-less blackish. #341, colors in life, venter ashy white, gular patch yellow-orange, general dorsal color of body gray with purple, rusty-orange especially along dorso-lateral row enlarged scales and below, on posterior surface thigh, on dorsal surface tail within inch of base.

26 July Arizona, Gila Co., headwaters Rose Cr., Rose Creek Lodge
Specimen taken on trunk of yellow-pine in public campground. Although very wary of noose never ran up high on tree but did get on tables and boxes of supplies on table under tree.
#387, adult ♂, colors in life; abdominal patches tourquoise blue, gular patch very pale light green, most of keels of tail scales with rust, iris gold. Mites at insertion posterior edge of thigh
#388, adult ♀, colors in life; gular patch pale orange anteriorly and laterally, yellow centrally and posteriorly. Abdominal venter without markings. Otherwise same as #387 except dorsal pattern less distinct. Mites in rictal.

W. Riemer
1949

Urosaurus ornatus

26 July — Arizona, Maricopa Co., 10.2 mi. NE ~~Roo~~ Apache Jct., State Hwy 88 Specimen taken on rocks in rock stream bed (dry). Taken with hand. Late afternoon. Cholla, prickly pear, palo verde desert.

#391, young ♂, colors in life; abdominal patches light greenish tourquoise anteriorly fading to obscurity toward groin. Gular patch yellowish grading to greenish yellow centrally. Mites in fold insertion posterior edge hindlimb. Iris gold.

27 July — Arizona, Yavapai Co., 6 mi. SW Yarnell, U.S. Hwy 89 Single specimen taken on dark vertical rock face. Massive rock pile. Lizard in dark phase, body temp. 36.6° C (1100 hours) though day hot and sunny. Not especially wary.

#392, adult ♂, colors in life; entire venter finely speckled with black, giving dark gray appearance except where other colors present as follows. Abdominal patches fusing in mid line a blue tourquoise and extending from posterior edge insertion forelimb to anterior edge insertion hindlimb. Also small preanal patch of blue tourquoise. Gular central patch of pale green tourquoise with yellow surrounded, except posteriorly, by lemon yellow with green over rest of gular area. Much orange rust on dorsum especially base of

W. Riemer
1949

Urosaurus ornatus

27 July Arizona, Yavapai Co., 6 mi. SW Yarnell, U.S. Hwy 89
tail. Iris pale gold. Mites concentrated
at posterior edge base of thigh, in rictal
and laterally on base of tail also. (4877 FH)

27 July Arizona, Yavapai Co., 1 mi. SW Yarnell, U.S. Hwy 89
Taken on vertical face of massive boulder
in area of large rock masses with oak
and chaparral. Xantusia under flakes of
same rocks.

393, adult ♀, colors in life; venter white except
gular which is pale lemon yellow. Dorsum
with much orange rust. Iris pale gold.
Mites concentrated in rictal, axilla, posterior
base of thigh, post anal fold.

W. Riemer
1953

Uroscaurus ornatus

20 July Mexico: Sonora:

Several adults taken from mesquite-like trees in late afternoon. 2 ♂♂ with following colors in life: Coal black to blackish-brown. One with heavy bright blue speckling on head as some in vertebral area. Belly patches intense bright blue, essentially confluent medially extending from pelvic to pectoral areas. Gular occupied centrally by bright orange-yellow spot in one, bright rusty-orange in other. Toward mental and labials this rapidly changes to blue passing through green in case of yellow throat. Another ♂ with black marks on tan dorsum with much blue dorsally and especially on tail which is almost entirely blue. Orange gular patch changes to yellow to blue on labials. ♀ light tan dorsally without black transverse bars. Ventrally white including labials except for bright red-orange gular spot.

W. Reiner
1949

Uta stansburiana

27 June Utah, Juab Co., 13.4 mi. S Eureka
Two taken. Body temp. 37.8, 35.6°C.
Appears to occupy same habitat here
as. Cnemidophorus tesselatus except not
seen under junipers but more often under
sage. For description of habitat ~~sex~~
Cnemidophorus tesselatus this date.
#172, freshly killed, scattered dorsal spots of
tourquoise - powder blue, laterally between
limbs yellowish suffusion shading to
pale apricot anterior-ventrally, ie. sides &
chest pale apricot as well as entire throat
anterior to gular fold, but grading to pale
lemon yellow middle of gular area then
whitish near mental. Touchs of blue at
margins of some of whitish scales near
mental. Lateral surface of tail with
pale orange suffusion. Otherwise, trunk dorsally,
grayish brown with black brown indistinct
blotches. Red mites concentrated in axilla,
on dorso-posterior point insertion of hind limbs
and at swollen base of tail laterally.
#173, freshly killed, same as 172 except
lacks apricot. Gular area medially with
pale slate-blue and laterally pale
lemon yellow. Mites ~~conten~~ concentrated
same as above ~~except~~ also in ear, rictal
fold and gular fold.

W. Reiner
1949

Uta stansburiana

6 Aug. New Mexico, Otero Co., Alamogordo

Young specimens common on lower part alluvial slope just E of town. Only ~~one~~ two adults seen and captured. Creosote bland almost pure. C. tessellatus also taken and common here.

#417, adult ♀, colors in life; venter white with bluish cast, gular gray with spots of orange from in front of eye to ear and extending 3/4 way to midline. Large scales bordering gular fold anteriorly with light orange laterally. Vertebral stripe brown gray with white spots, ground color tan, lateral light stripes on both sides buff. Post axillary patch black. Considerable yellow orange above insertion forelimb and laterally on neck. Iris pale gold.

#418, young, colors 3 hours after death; venter same as above except orange of gular pale, dorsum same except blackish spots in brown ground color, lateral stripes more distinct, post-axillary patch and color above forelimb insertion essentially absent.

W. Riemer
1950

Uta stansburiana

9 Mar. Texas: El Paso Co., 10 mi. E, 3½ mi. S Mt. Franklin

13 adult specimens taken in morning and late afternoon. Noosed, shot and taken by hand. In areas sun no longer reached in late afternoon found specimens under surface litter; cardboard, metal, paper, etc. All tended to hug closely vicinity of bushes and would not stop in open if chased out of brush. Wary until rather cool in afternoon. Difficult to noose when warm. All with considerable color as if in or near breeding season. Other evidence: one ♀ contained at least two ova (9 and 10 mm long) which were extruded through wound hole in abdomen. Habitat: barren rather flat country with scattered creosote bush and a currently leafless, very thorny mesquite-like shrub. Soil, sandy-gravel. Located on eastern outskirts of El Paso close to oil storage depots. Soil slightly damp under larger pieces of litter. Weather: clear, comfortably warm, sunny. Holbrookia texana also present.

W. Riemer
1949

Xantusia arizonae

(4877 ft.)

27 July Arizona, Yavapai Co., 1 mi. SW Yarnell, U.S. Hwy 89

Two specimens taken by R. Stebbins under rock flakes of granite. Both flakes on shady ~~sou~~ side boulders with openings downward. For detail description of niche see R. Stebbins notes.

395, adult, colors in life; venter very pale yellow with gray and green. Green perhaps dark color of gut showing through. Ventral portion original tail pale yellow with gray, regenerated portion white with little dark tan. Gular white with bluish-pink cast. Top of head yellow-tan with dark greenish between eyes and over brain area. Dorsum of body green-gray with overlay of orange-tan especially on neck. Dorsal surface original tail same except greenish largely lacking. Regenerated tail transparent orange-tan above. Laterally body smoke gray. Dark spots of body deep dark brown. Iris orange rust.

Snakes

W. Reiner
1949

Arizona elegans

13 July Arizona, Pima Co., 7.0 mi. NNE Ajo

Specimen taken on road at about 2330 hours. Warm, clear, moon up about 45 minutes and 3/4 phase. Only 1 other of same species seen on road in that vicinity. Died of heat. Colors; blotches greenish-tan, spots on individual scales brownish-red.

24 July Arizona

Specimen taken on road 2105 hours. Night dark and clear, no moon. Rain storms close by during day but unknown whether had rained at locality.

378, adult, colors in life; dorsal blotches yellowish-tan with light olive, dorsal scales with central patch of mixture of olive and red appearing like rusty-tan. Venter white. Top of head gray with olive tinge Iris rusty gold.

W. Riemer
1949

Arizona elegans

10 Aug. New Mexico, Roosevelt Co., 24.2 mi. N Milne Sand, State Hwy 18. DOR taken in early afternoon on road shoulder. Probably hit during last evening. Short grass prairie with small yucca clumps of several plants. One foot or less in height. On far side of road cultivated plot of mylo-maize.

#, dead but in good condition; venter white, body blotches dorsal and lateral olive-tan margined with black. Vertebral areas between dorsal blotches rusty-salmon with margins of scales very light and yellowish. Laterally salmon scales with brownish ~~centrall~~ centrally with salmon more ~~proximal~~ on scale. These also light edged. Little or no salmon on first or second scale rows. Iris reddish-brown.

W. Riemer
1950

Bothrops godmani

1 Apr. Mexico: Chiapas: 6 mi. SE San Cristobal, 7300 ft.

Specimen taken under piece of wood on ground in cool of morning in grassy, shrubby portion of cleared area. Many stumps and logs present. Sceloporus and Pituophis also present. Do Sceloporus provide prey for Bothrops. Gentle. Made no attempt at escape.

W. Reiner
1950

26 Mar. Mexico; Chiapas; 6 mi. SE San Cristobal, 7300 ft.
One specimen taken under piece of bark on ground. Bark 2 ft. by 4 in. by 2 in. thick. Coiled into slight depression in ground. Temp of animal 19.6°C. 1615 hrs. Site well shaded at that time, in bottom of broad pass inbetween hills. Pines and broad leaves in open association, 20 - 50 ft. apart. Grass and leaf litter present. Animal made no attempt at escape but when picked up emitted strong odorous material from vent. Odor not not like that of Thamnophis or Diadophis.

W. Riemer
1947
1948

Coluber constrictor mormon

4 3/10 mi. S. San Francisco Co. line, Skyline Blvd., San Mateo Co., Calif.

(1947) 25 Aug Two individuals taken, one other observed. Found in proximity of ponds and in same habitat as Thamnophis sirtalis infernalis and T. ordinoides atratus. Occurred abroad in grass and under objects such as iron sheeting and lumber.

(1948) 12 May Head Hamilton Gulch, Berkeley, Alameda Co., Calif. 1005 single half-grown individual seen in Sceloporus study area. Important here in that a predator of Sceloporus. Weather: Sunny but cool. Situation: grass & thistle through chaparral very close by.

22 May Two individuals taken at 1745 and 1645 within 6 ft. of each other. One brought to attention by unusual actions of a Sceloporus under observation. Snake about 24 inches long. These taken within 6 ft of spot individual seen 12 May 1948 (above).

W. Riemer
1949

Coluber taeniatus

27 June Utah, Millard Co., 2.3 mi. NE Delta, U.S. Hwy 6
1 DOR for record only. Shrubby with green weedy growth between shrubs. Flat desert. Stream courses intersect area.

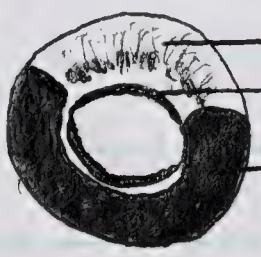
27 June Utah, Millard Co., 1.3 mi. NE Delta, U.S. Hwy 6
1 DOR for record only. Same habitat as above.

W. Riemer
1949

Coluber taeniatus

26 July Arizona, Gila Co., headwaters Rose Cr., Rose Creek Lodge

Specimen first seen by R. Stebbins on shoulder of dirt road; escaped down embankment. Shortly after seen in same area sunning (?) on log at foot of embankment. Escaped into log which was in part hollow. Probing with stick permitted taking hold of tail and snake pulled out. Made no attempt to bit. See R. Stebbins notes for details. #389, adult, colors in life; ventral surface throat, chin, most of supralabials white. quickly grading into mustard yellow 1 in. posterior to head, 8 in. anterior to vent yellow replaced blotchily at first by red-orange. Posterior to vent ventral color a rich coral red. Top of head olive-brown. Vertebral dark stripe brown with red anteriorly grading to brown at vent. Lateral light stripe lemon yellow anteriorly grading to white 2/3 distance to vent. Tongue black with dark purple base.



rt. eye ant. ⇒

W. Riemer
1949

Crotalus atrox

24 July Arizona

DOR, record only. Young specimen well crushed though banded tail still obvious.

W. Rieman
1949

Crotalus molossus

17 July Arizona; Santa Cruz Co., 2 mi. W Peña Blanca Springs

Single animal taken shortly after dark while animal crossing road. Two of party had walked within foot of animal at edge of road. As R. Stebbins passed spot he heard click of rattle as snake left road on downhill side. Spotted with gas lantern. Why didn't snake rattle? Too cold? Temperature not uncomfortable without shirt! Had rained heavily during afternoon and wet substate may have been considerably cooler than air. About mile away substrate temp. few minutes before was 22.0°C Air 25° C at same spot. This species said to be commonest rattler in area by one of local forest service personel. Not sure of reliablity of word however.
#330, colors just after death by dry heat; venter white on throat and head though yellowish invading beneath angle of jaw. At midbody ventral white graded to very pale yellowish-green adding gray gradually toward vent. At vent very pale yellowish green-gray. Venter of tail silvery dark gray. Dorsum of head black at snout grading to sooty brown over eyes to greenish-tan above angle of jaw. Other mark on top

W. Riemer
1949

Crotalus mollosus

17 July Arizona, Santa Cruz Co., 2 mi. W Peña Blanca Springs

♂ head also sooty brown. Ground color of head yellow-green-olive. Dorsal blotch at mid body sooty-brown bordered vertebrally by yellowish-green and more laterally bordering scales become tipped with whitish. lateral diamonds olive-green. lateral dark spots brown dorsally grading to tan ventrally. Gray added posteriorly until at vent dorsal blotches gray-brown, lateral blotches gray-olive. Tail black dorsally and laterally.

W. Riemer
1949

22 July

Crotalus triseriatus

Arizona, Cochise Co., Huachuca Mts, Carr Canyon

Specimen taken 1340 hours at edge of trail. Small low retaining wall of loose rock with dead leaves below and thick tangle of herbage immediately adjacent. Also area on edge of large open area of sunflowers(?). Snake coiled below wall on dead oak leaves; made no attempt to rattle until touched with stick during capture although on being first discovered attempted escape into rock wall. Oaks, conifers, grass, various annuals about. Heavy rains on previous day and night(?). Heavy overcast all of 22nd. Gut distended with food.

#366, colors in life, ~~ventral~~ ventral ground color of body pale salmon over lain by much speckling of melanin. Gastrosteges of ventral side head essentially white while other scales (laterally and anteriorly) of ventral side head light pinkish salmon. Dorsal ground color lavender-gray as very fine salt and pepper speckle, vertebrally yellow tan appears at base of such scales. Dorsal blotches speckling of black and brownish tan, bordered by black. Lateral blotches ~~similar~~ similar except weaker and not bordered.

W. Riemer
1949

Crotalus triseriatus

22 July Arizona, Cochise Co., Huachuca Mts, Carr Canyon

Stripe behind eye blackish olive; light patch below pale yellowish salmon. Base of rattle light orange salmon; rattle itself brownish tan. Dorsal third of iris yellow tan; rest blackish. At no time did snakes fully extend tongue and wave it vertically upward and downward as did C. molossus but merely extended black forked tips.

W. Riemer
1953

Crotalus triseriatus

11 July — Mexico: Durango(?): 5 mi. by road SW La Ciudad, 8500 ft.

2102. Colors freshly killed: Dorsum brownish grey with suffusion of yellow near neck and above vent, blotches brown. Venter brownish-red grading to brownish-yellow on neck. Underside of tail brownish-yellow. ~~Chin~~ Gular pale pink. Proximal rattle red, rest grey. Iris orange brown.

W. Riemer
1949

Crotalus viridis

27 June — Utah, Juab Co., 8.4 mi. NW Juab Co. line, U.S. Hwy #6

Specimen DOR for record only. Rattles had been removed. Treeless, hilly grassland. Sandy substrate with rocky outcrop on hill above road where found.

W. Riemer
1952

Crotalus viridis

5 Apr. Calif.: Alameda Co., 5 mi. E, 1¼ mi. S Mission Sanfose

Adult taken while stretched out full length in sun on little used roadway. Road surface 36.5° C, air at 2 cm from road 28.4° C, at 1215 hrs. Tongue noted especially as being blue and black rather than red and black.

5 Apr. Calif.: Alameda Co., 2 mi. W, 5¼ mi. S Midway Corral Hollow

Juvenile taken while crossing dirt road in steep rolling hills. Grassland with occasional small oaks. Road temp. 35.0° C Air 1 cm above road 29.0° C. 1510 hrs.

Riemer
1948

Diadophis amabilis amabilis

14 Apr. U. C. Campus, Berkeley, Alameda Co., Calif.
1330 Single individual crossing path on lower part of campus. Surrounding vegetation thick and largely non-native. Stream close by. Weather: warm though not sunny.

W. Reiner
1952
1953

Diadophis amabilis

Mocho, 1500ft.

5 Apr. Calif.: Alameda Co., 1 3/4 mi W, 2 mi. N Cedar Mt., Arroyo A Single small individual on clean sandy bank at edge of small (1-2 foot wide) brook. Stream with steep pitch and many rapids and falls. Steep sided ravine with many large rocks, oak, tan-bark, Sambucus as woodland stand in grass covered hills. Stream temp. 19 3/4° C. Weather overcast, cool, no sun, at 1615 hrs. Rana boylii also in stream.

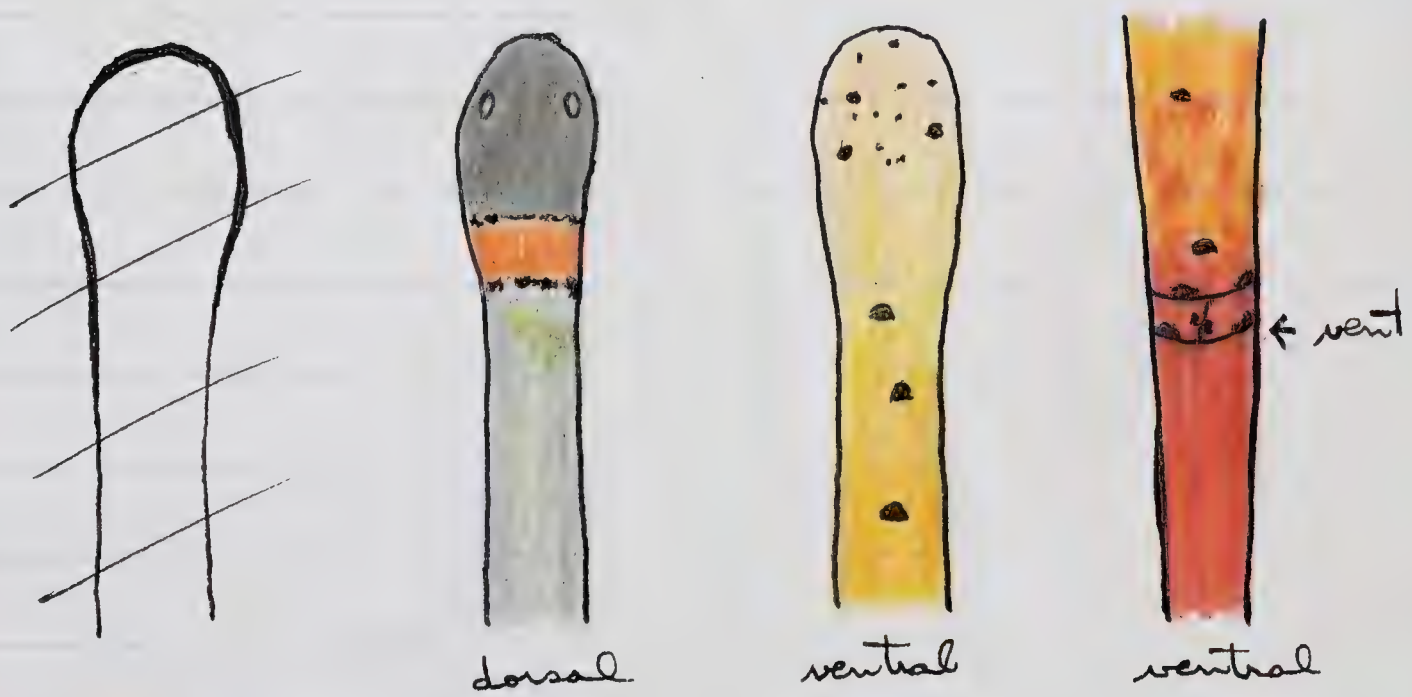
1953
15 Feb. Calif.: Napa Co., 4 mi. N, 1 1/2 mi. W Calistoga Two Diadophis under adjacent pieces of cover, one large and one small snake. 1575 hrs. Semi-sunny hillside with short grass, Douglas fir, madrone, oak, digger pine. Close to base of rocky outcrop, one under rockslab, one under small piece of rotten wood. Another taken five feet away with two Eumeces under rock slab on damp soil. Weather; cool, clear, sunny. Another very small individual in loose rocky-humus material in wide cleft between rocks at top of ridge. Buckeye and bay also present here. Humus slightly damp

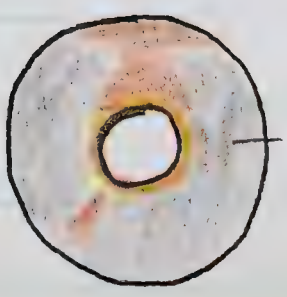
W. Riemer
1949

Diadophis regalis

16 July — Arizona, Santa Cruz Co., 1 mi. NE Peña Blanca Springs

Single specimen taken well after dark as anterior half of body protruded from under rock resting on damp sand at edge of and 4 inches above water in small rock-walled pool in stream channel below Peña Blanca Springs. Associated plants ocotilla (well leafed), yucca (?), course grass in tufts in channel above and below pool. Larvae in pool and adults of Hyla arenicolor, B. punctatus, M. carolinensis taken either in that pool and vicinity or similar pools immediately up or down channel. When animal grabbed emitted characteristic disagreeable odor of D. amabilis of coast.
#300, adult, ~~tatoo~~ colors in life;





This pattern and colors may not be accurate

D. Rainey
1953

Drymobius margaritiferus

21 Aug. Mexico: Guerrero: Pie de la Cuesta, just north of Acapulco

Single individual, caught by Jose Garcia, now stored in Oakland Public Museum, Student Dept. Brought in to M.V.Z. by John Lawrence. Determined as a race ~~fistulosus~~ fistulosus by myself.

W. Riemer
1949

Ficimia cana

1 Aug. New Mexico, Grant Co., 0.4 mi. NE Santa Rita, State Hwy 180 Specimen taken about ~~9:30~~ 2100 hours while crossing black top road just above town. Elevation 6500 ft ± Night dark, cool and intermittently lightly raining. Apparently had rained rather heavily during afternoon. No other snakes seen definitely on road that night though several hours driving done after dark mostly in areas where rains had occurred. Easily taken making no attempt at escape. Habitat as checked in daylight one of pinon pine, two species juniper (one green the other gray-green), Matilija poppy (in bloom), a gray 12 inch sage, short green grass. Soil reddish-brown and gravelly. Scattered grayish rock on surface. No habitations in immediate vicinity.

#412, adult, colors in life; venter bluish-white with speckling medially of orange rust. Ventral surface tail completely suffused with same rust with yellow tinge. Along medial ventral line of tail a suggestion of greenish-yellow. Dorsal ground color vertebrally a light tan grading laterally to white scales with rich

W. Riemer
1949

Ficimia cana

1 Aug. New Mexico, Grant Co., 0.4 mi. NE Santa Rita, State Hwy 180.
salmon suffusion proximally and
weakening at tip and free edges. Dorsal
blotches yellow-brown with fine sprinkle
of black. Blotches margined largely by
black. Iris reddish-copper. Tongue black.

W. Reiner
1953

Hypsiglena sp.

6 July Mexico: Durango: 16 mi. N Durango

Single adult taken on highway late at night. Colors, when freshly killed, #2037: Venter mother-of-pearl except chin, which is dusty brown. Collar sooty brown, dorsal blotches only a ~~light~~ little lighter, sides light chocolate brown. Iris golden tan.

13 July Mexico: ~~D~~ Sinaloa: 5 mi. N Mazatlan

Single DOR taken night after heavy rain on highway about 2130 hrs. Thorn forest.

W. Reiner
1953

Leptophis diplotropis

14 July Mexico: Sinaloa: 9 mi. N Mazatlan

#2160. Taken in dead prostrate tree at edge of muddy pool where numerous anurans breeding. late afternoon. Colors; freshly killed: Dorsum light grass green; Venter white on chin changing rapidly to brilliant yellow and fading gradually to dull greenish yellow at vent. Iris bright tarnish gold.

W. Riemer
1949

~~Coluber~~ Masticophis flagellum

3 July Utah, Washington Co., 5.7 mi N Saint George, State Hwy 18 DOR adult for record only.

Riemer 1948

Masticophis
~~Coluber~~ lateralis

26 Apr Berkeley Hills, Alameda Co. Calif.
Individual captured under old lumber top first hill head of Hamilton Gulch. Habitat: grass with scattered thistle. Chaparral slopes within 75 feet; conifer stand within 150 feet. Noticed as head protruded from under boards. Time: about 1330.
13 May 1948 Color notes: Dorsal ground color; neck, mid-body and nearly to base of tail — Black with velvet texture. Base of tail and continuing to tip — Olivaceous Black (1). Lateral ground color; neck, mid-body to base of tail — Olivaceous Black (3) though thinning near base of tail. Side of tail (lateral dark stripe stops at base of tail) — Isabella color. Ventral ground color; neck, Rose Orange gradually fading to Mustard Yellow at mid body which changes gradually to Coral Pink at vent. Mean tip of tail - light Coral Red. Lateral stripe ground color; Maize Yellow at neck, light Orange-Yellow at midbody, Ochraceous-Buff at vent, blends into dark lateral stripe at this level. Actually orange hue appears to overlie a pale yellow stripe but

~~Coluber~~ Masticophis lateralis

26 Apr. Berkeley Hills, Alameda Co., Calif.
13 May, 1948
Distribution of pigment to uniform to easily detect condition except in neck region where more or less clumped into blotches at distal end of each scale forming Apricot Orange spot of a rough irregular nature. Distinctness of spots quickly diminishes posteriorly. Chin — White with very fine and thin suffusion of Grenadine Red. Upper labials 1-4 with stripe of Grenadine Red along ventral edge. Middle of 6th supralabial with large spot of this color, continuing postero-ventrally over 7th supralabial. Iris — Ochraceous Buff hue of gold. Clear area about pupil, rest suffused with heavy black except thin dorsal to pupil.

22 May Head of Hamilton Gulch, Berkeley Hills, Berkeley Alameda Co., Calif. Individual escaped capture at spot 100 ft. E point above specimen taken. Time: 1410. Apparently disturbed while resting in clump of grass during heat of day. Weather: hot, sunny, clear. Anxious to get this specimen since may show characters confirming those of above which may be new race.

W. Riemer
1952

Masticophis lateralis

27 April Calif.: Tulare Co., 8.5 mi. NW Woodlake

1779 ♂ Richard Zweifel. Pigmentation from the living animal: Vertebral ~~color~~ portion of dorsal color black or intensely blackish brown. Lateral portion of dorsal color slaty-brown. These above colors at midbody. Lateral light stripe at midbody 9D1 (Maerz and Paul 1930). Color essentially the same from neck to area forward of vent where stripe tends to become obscure. Chin and throat black for first 7 ventrals is pure white spotted with black. Venter 9K4 at length of head back of head, 9K3 at midbody, 11A8 at the vent, 12A10 on ventral side of tail. Colors grade imperceptibily into one another ventrally. Upper portion of supralabials and other light areas on head tend toward very light cream. Iris color 10J5.

1953
23 Mar. Calif.: Calaveras Co., 1¼ mi S, 2 mi. W Copperopolis

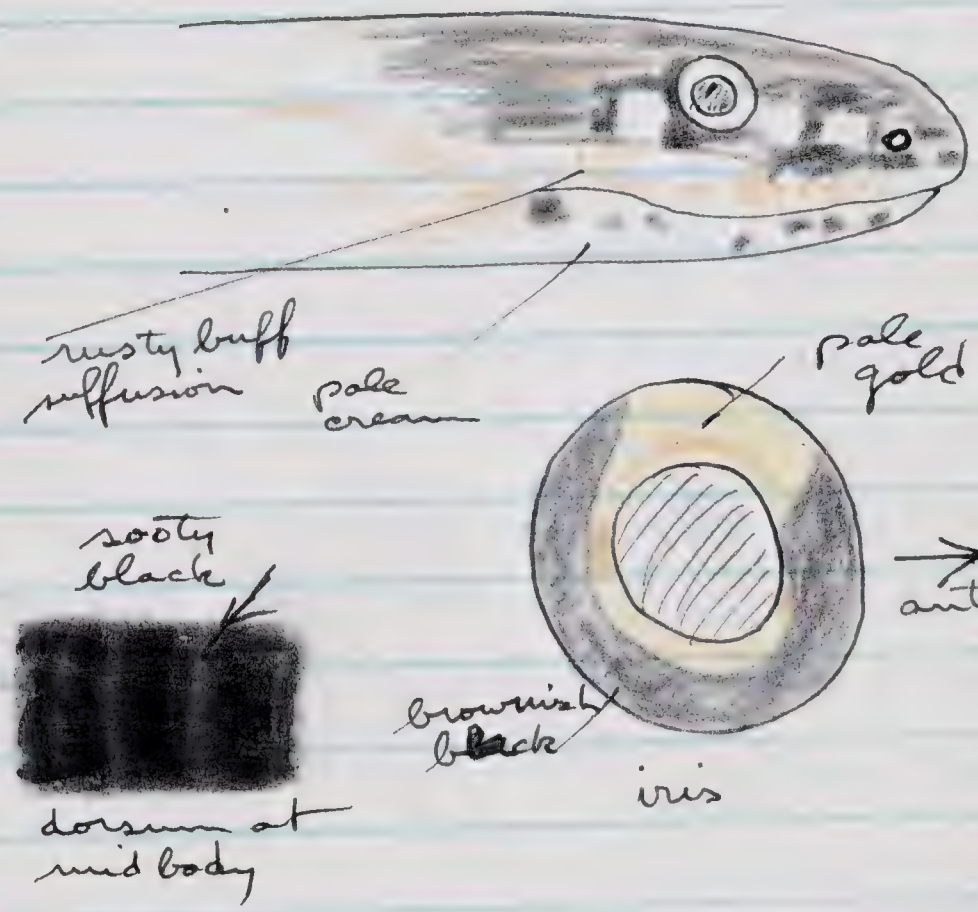
Young, 2 ♂. DOR taken in digger pine-oak woodland. Large but temporary stream close by. Chin spotted normally. Throat spotting weak and limited to most anterior series of ventrals. Just a suggestion of rufous on lateral hues. Chin white, throat ~~rufous~~ deep straw. At best shows only the very slightest suggestion of eurystanthus in weakness of throat spotting and flecks of rufous on anterior lateral stripe.

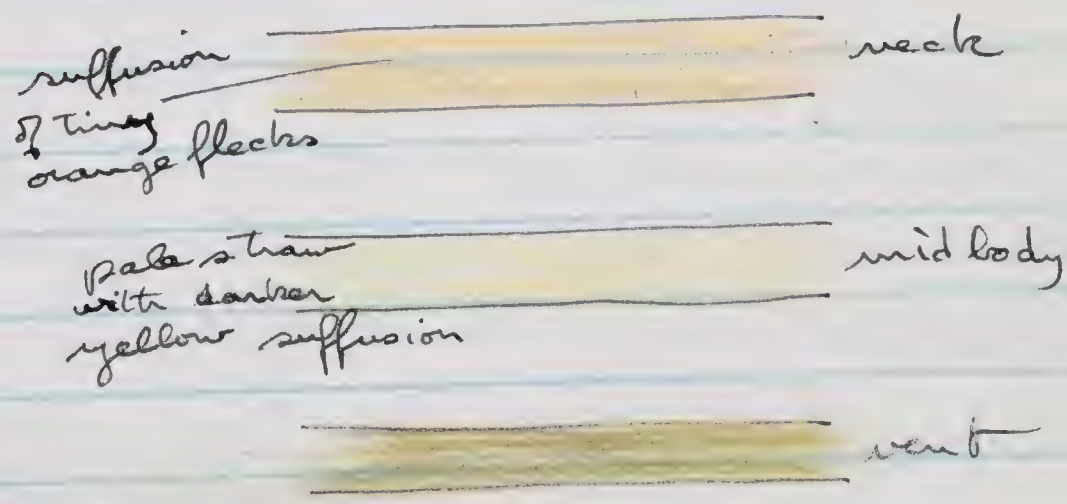
W. Riemer
1953

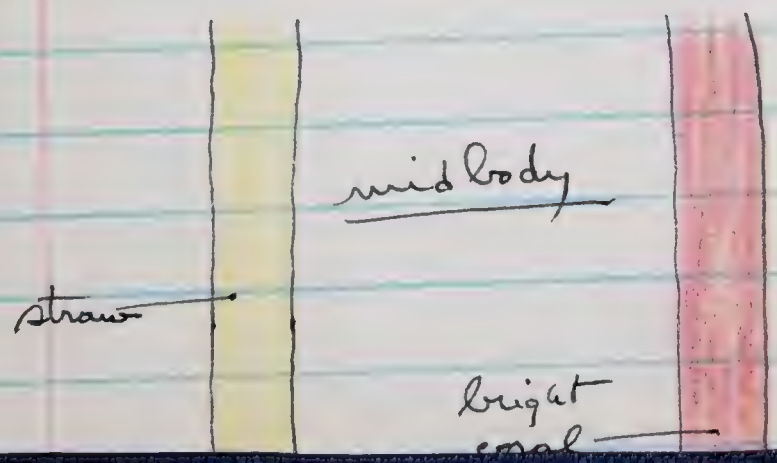
Masticophis lateralis

July Calif.: Alameda Co., 14 mi. SE (by rd.) Livermore, Arroyo Mocho

Single adult captured by R. Stebbins. Appears to be good intergrade between eurythanthus and lateralis with only slight tendency (25-33%) toward eurythanthus. Colors in life:







J. Riemer
1953

Masticophis lateralis

26 Jan Calif.: Alameda Co., Oakland ~~Peoria~~ [Heights ?] Park

On this date a single juvenile collected by a Don Osmer. The specimen is a perfect example of M.l. ~~eurygaanthus~~ (in press) having: 1.) A lateral light stripe of 1 and 2 ~~halfs~~ half rows width. 2.) A very few, small, weak dark spots on the chin; a few gray wisps on the throat; no trace of spots on neck. 3.) Dorso-lateral light line connects broadly with ventral light color. 4.) No dark loreal borders dissecting orbito-nasal light stripe. 5.) No trace of a rostral continuation of the supra-labial dark stripe. 6.) Dark dorsal color does not invade edges of ventrals for a distance of about 4½ times the snout-to-posteria-edge-of-parietal-distance back from the snout.

The specimen retains no traces of a rufous pigmentation on the pink of the tail region. It bears the imposing number: #I/a:1/b:20:IV/c:II:2/d:1:II/e:1. Currently stored in Student Dept., Oakland Public Museum. loaned to me during Oct. 1953 by John Lawrence.

W. Riemer
1950

Micrurus

10 apr. Mexico : Chiapas : 28 mi. ESE Comitan, 4900 ft., San Jose.

Specimen taken in and under damp rotten log at edge of thicket of blackberry thicket in open pine and broadleaf tree forest. Near small muddy stock pond. # 771, color of light band on head dusky yellow. Little other yellow dorsally present on body. Below bright yellow poorly separating red from black. Red and black only on back. Red a bright orange red ventrally but a little dusty above. Iris black. Called locally "coral" [core-awl'].

D. Rainer
1953

Natrix valida

30 Aug. Mexico: Guerrero: Pie de la Cuesta
Individual of race isabellae. Stored in
Oakland Public Museum, Student Dept.

W. Riemer
1950

16 Apr. Mexico : Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose
805, color of dorsum yellowish-green, venter lemon yellow on neck and just behind changing to greenish-yellow at midbody and pale green on under side of tail. Chin yellowish-white. Malleus yellow, black post-ocular stripe, iris golden olive. Pitelka in returning from jungle area came across this specimen crossing road. It took refuge in a small maple assuming a stiff posture so that combined with green color it was very difficult to see in the shrub. Called locally "bejuquito" (spelling?) [bay-who-key'o]. Situation: open mixed woods.

18 Apr. Specimen # 819 taken on road about noon on sunny day by C. Koford. Mixed open forest near Tierra Blanca. Crawling across roadway when taken.

W. Riemer
1948

Pituophis catenifer

9 mi. NNE Coalinga, Fresno Co., Calif.

19 July Single specimen taken by night driving on State Hwy 33. Animal was only reptile seen during almost entire night of driving. Full moon shining brightly.

10 mi. E Los Banos, Merced Co., Calif.

19 July Single specimen DOR on road.

W. Reimer
1949

Pituophis catenifer

22 June Nevada, White Pine Co., 3 mi. NW Preston
#149 taken while crossing pavement in late afternoon. Cool and cloudy. Flat, dwarf sagebrush desert. Impressed by extreme whiteness of animal.

27 June Utah, Juab Co., 13.4 mi S Eureka
DOR, well flattened. For account of terrain see Cnemidophorus tesselatus this date. Specimen not taken, for record only.

27 June Utah, Utah Co., 13.9 mi. E Juab Co. line, U.S. Hwy 6. DOR for record only.

~~27 June Utah, Utah Co., 8.5 mi. NE Delta~~

27 June Utah, Millard Co., 8.5 mi. NE Delta, U.S. Hwy 6
DOR record only. 18" long. Desert flat with thick stand 2 ft. green brushy sage(?)

27 June Utah, Millard Co., 7.6 mi. NE Delta, U.S. Hwy 6
DOR's for record only. 1 adult, 1 - 14" long. Same terrain as one above.

27 June Utah, Millard Co., 7.2 mi. NE Delta, U.S. Hwy 6
DOR (in R. Stebbins catalogue). About 14" long. Same habitat as above.

27 June Utah, Millard Co., 4.8 mi. NE Delta, U.S. Hwy 6
2 DOR's for record only. Adults, 2.5 ft.

27 June Utah, Millard Co., 4.2 mi. NE Delta, U.S. Hwy 6
1 DOR for record only. About 14" long

27 June Utah, Millard Co., 2.8 mi. NE Delta, U.S. Hwy 6
1 adult DOR for record only. Plants sparser and more stunted.

W. Riemer,
1949

Pituophis catenifer

28 June Utah, Millard Co., 5.1 mi. WNW Holden, State Hwy 26. 1 DOR for record only. Cultivated grain on one side road sage(?) on opposite. Flat desert.

3 July Utah, Washington Co., 2.0 mi. NW Saint George, U. S. Hwy 91 DOR adult for record only.

20 Aug. Colorado, Weld Co., 5 mi. WSW Wiggins (in Morgan Co) Large specimen taken while stretched out running at 1000 hours on essentially level area between adjacent sand hills. Substrate sandy and damp from last nights rain. Grasses and sunflowers about but not completely covering soil. Wind strong but gusty, sunny, clear, just becoming warm. Terrapene, E. multivirgatus also taken in area. Specimen made no attempt to escape until gun barrel pressed against neck. Pulled body forward and quickly wrapped about arm. Did not constrict tightly. Hissed.

468, adult, colors in life; ventral surface pale yellow except white on chin and throat. Dorsal ground color milk anteriorly, cream or pale yellow at midbody, yellow tan on tail. Dorsal blotches brown on neck becoming

W. Riemer
1949

Pituophis catenifer

20 Aug. Colorado, Weld Co., 5 mi. WSW Wiggins (in Morgan Co.).
olive-brown immediately posterior and fading to olive-tan at midbody darkening again just anterior to tail base and changing to deep sooty brown on tail, almost black. Anterior foot of body with darker margins to dorsal blotches. Top of head ~~speckled~~ olive yellow speckled with black. Iris olive-yellow but dark gray obscuring color anteriorly.

W. Riemer
1953

Pituophis catenifer

26 June Mexico: Chihuahua: 1.6 mi. W Padernales

Single small adult taken within adobe ruins on river flood plain in mountainous, rocky, scrawny pine - oak forest. Belly pure white.

28 June

W. Reiner
1950

Pituophis deppei

1 Apr. Mexico : Chiapas: 6 mi. SE San Cristobal, 7300 ft.
Specimen taken in cool ♂ morning in open cleared area. On ground amongst grasses and shrubs. Made no attempt at escape. Bothrops taken nearby and Sceloporus also present. Koford has trapped Reithrodontomys and Peromyscus in this area.

W. Reiner
1953

Pituophis deppi

20 Aug. Mexico: Aguascalientes: just south of Aguascalientes
Stored in Oakland Public Museum, Student
Dept. Race deppi.

W. Riemer
1949

Rhinocheilus lecontei

24/July Arizona

Specimen taken on road 2125 hours. Body temp. 29.2°C. Air temp. 29.0°C. Road warm to hand. Night clear and dark, no moon. On alluvial fan. Mesquite and creosote.

379, adult, colors in life; venter cream, dorsum black and paprika red. Red and black separated by half scale of cream in general though border irregular. Iris dark red rust.

W. Riemer
1950

Thamnophis

10 Apr. Mexico: Chiapas: 28 mi. ESE Comitan, 4900 ft., San Jose
#770, color of venter pale greenish with rusty suffusion laterally on gastrosteges. Dorsally body deep olive with light greenish olive dorsal stripe and light green lateral stripes in area one-quarter back from head. Iris brown. Snake found in road apparently freshly killed by some native. Rolling terrain covered by pine and broadleaf forest. Small (15 ft.) pool nearby with many frogs. Called locally "chaghiw" [cha- sheep].

13 Apr. Specimen brought in by native. Said to have been found near lake shore by boy with a dog.

1 May Mexico: Guerrero: 3 mi. W Omiltemi, 8200 ft.
Two specimens taken by F. Pitelka, young one on road in canyon bottom near stream, dense mixed pine - oak forest, much understory. Large individual in dry oak- pine forest in leaf litter, no water nearby.

W. Reiner
1953

Thamnophis sp.

6 July Mexico: Durango: 22 mi. N Durango, 6300 ft.

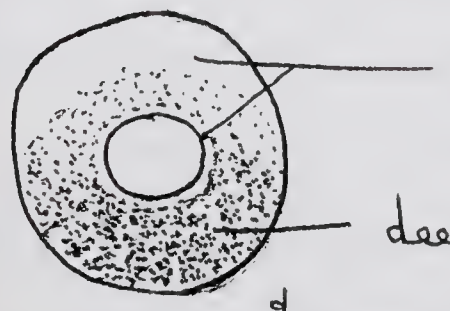
#2034. Taken on highway late in evening in area where rain had recently fallen. Colors when freshly killed: Venter white. Dorsum olive tan with black spots. Vertebral stripe and ~~crescents~~ crescents light cream or milk. Top of head brownish olive. Iris deep brick red dorso-ventrally and black anterior posteriorly. Narrow gold pupillary ring incomplete anteriorly.

W. Riemer
1949

Thamnophis angustirostris

1 Aug. New Mexico, Co., 1 mi. above X S X Ranch, E. Fork Gila River Two young specimens taken. One taken on ledge of rock 1 ft. above small sheltered pool at edge of river. Massive rocky pinnacles with numerous fractures and holes may well provide shelter. At this point river flowed against base of rocks. The other specimen taken at edge of main stream amongst grass. Partially submerged in water. Associated animals also taken; R. pipiens, T. eques.

410, young, colors in life; venter white with trace of olive on posterior two-thirds, ventral surface tail pale olive with gray. Dorsal ground color brownish olive, spots with black skin, deep brown scales. Spots largely disappear two-thirds back along body. Stripes not in evidence. Plates of top of head grayish olive. Tongue tan-olive with blackish marks dorsally at



grayish tips. Light brownish-gray suffusion laterally on body best seen at lateral ends of gastrosteges.

W. Riemer
1953

Thamnophis cyrtopsis ~~cyrtops~~

2 July Mexico: Chihuahua: 7 mi. SW El Vergel (=Chaguita), 7800 ft
1978. Chin white. Greenish-~~yellow ventrally~~ medially along entire venter. Dorso-laterally skin black and bluish-white. White becomes greenish-yellow on skin of neck. Vertebral stripe pale orange becoming bright orange on neck. Nuchal blotches black, top of head slate gray. Tongue red with distal half black. Iris essentially black, with silver pupillary margin around the ~~e~~ posterior ~~ventr~~ arc.

W. Riemer
1949

Thamnophis ~~sirtalis~~ elegans

24 June Utah, Salt Lake Co., 1.5 mi. E Murray
#152, taken under board in meadow-like situation, grassy, intersected by many channels and pools of fish hatchery. Within 4 ft. of sunny algae filled pool. Temp. under board 30° C. For pigmentation see below. One seen abroad in grass at very edge of stream with considerable flow. Escaped into stream. 1715 hours, warm and sunny.

25 June Utah, Utah Co., 13 mi. NE Provo
#153, taken in high (2-3 ft.) grass and weeds within 50 ft. of stream. Hot and sunny. At edge of old shack. Mountainous area with much rock and heavy growth of small trees, large broadleaves and some conifers. Collection site actually in small meadow-like situation. See below for pigmentation.

25 June Utah, Utah Co., Provo, Campus Brigham Young University
#154, taken in cultivated ~~bypasses~~ beds and lawn situation not close to water. Foothill area. Hot and sunny. See below also.

24 June Utah, Salt Lake Co., 1.5 mi. E Murray #152,
Freshly shed when killed. Yellow, greyish-brown, black dominant colors. Lateral and dorsal stripes yellow. Paired or alternating black squares (?) border dorsal stripe. Smaller black blotches above lateral.

W. Reiner
1949

Thamnophis elegans

24 June — Utah, Salt Lake Co., 1.5 mi. E Murray (#152) stripe. Black blotches lie within longit,- udinal brownish gray stripe. Skin, anteriorly, alternatingly black and greenish yellow banded. Pinkish orange on gastrosteges & ~~throat~~ neck and on distal edges of labials. Pink gives way to greenish yellow on anterior portion of gastrosteges over rest of venter. Most intense laterally.

25 June — Utah, Utah Co., 13 mi. NE Provo
#153, similar to above specimen except lateral stripe anteriorly tending toward pinkish tan. Dorsal stripe tan. Pinkish absent from labials but entire length of body gastrosteges pink at proximal edge. Entire animal darker and lacking largely the yellow appearance. Iris, with yellow gold narrow ring about pupil reddish brown changing to deep brown radially

25 June — Utah, Utah Co., Provo, Campus Brigham Young University
#154, ♂, lateral stripe anteriorly pinkish tan. Dorsal stripe yellow. Area between black blotches laterally lavender tinted gray. Ventral surface heavily melanistic and without yellow or pink as above two specimens

W. Reimer
1949

Thamnophis elegans

29 June Utah, Garfield Co., 19.2 mi. SSW Junction U.S. Hwy 89 #183. Young specimen taken at edge of marshy area. Grass, and some sedges. Broken desert surrounding area. Ventral surface uniform pale silver gray. Lateral and dorsal stripes poorly defined, pale lemon yellow iris with pale gold ring about pupil with small spot of coppery dorsad most on iris, remainder a muddy dark brown.

30 June Utah, Kane Co., 2 mi. W Alton #185, young, taken on roadway. Swampy area on one side road, conifers and sage on other. Colors alive – dorsal stripe milk color on neck, fading until absent on posterior half body. Suggestion of lateral stripe only about neck. Dorsal and dorso-lateral spots black and tan anterior part of body, interspaces buffy gray. Ventrally a pinkish-gray medially at posterior portion body. Upper portion iris red ~~copper~~ copper, ring about pupil-gold. Impressed by overall lightness and reduction of dorsal spots.

W. Riemer
1949

Thamnophis elegans

28 July Arizona, Coconino Co., 8 mi. SSW Flagstaff, U.S. Alt. Hwy 89

Two specimens taken. One in water at edge of artificial fish pool and one in grass 30-40 ft. from pool.

#400, young, colors in life; pale olive yellow venter at midbody, chin white, dorsum at midbody sooty gray, lateral spots olive tan, iris copper, tongue red with black tip

16 Aug. New Mexico, Sandoval Co., Holy Ghost Recreation Area, W Tesuque, 7850 ft.

One young specimen taken in small sunny opening in rather dense conifer aspen forest. 100 ft. from stream. Several rotten salamander-type logs in opening for which animals search was being made. None found.

#459, young, colors in life; venter yellowish green olive with buffy laterally. Underside chin and throat white. Vertebral stripe yellow-olive becoming tan posteriorly, lateral stripes yellow-olive on neck and becoming darker posteriorly and obscure at midbody. Dorsal ground color gray-brown. Top of head olive brown. Supralabials buffy. Iris with central ring of pale mustard about pupil, gold dorsally grading to red copper on periphery.

W. Riemer
1952
1953

Thamnophis elegans

31 May — Calif.: Plumas Co., North Fork Feather River, Seneca

Small vagrans(?) taken while sunning on rocks at edge of main stream. 0815 hrs. Sun barely beginning to take chill off rock faces. Large vagrans taken by Zweifel with mass of yellow eggs in gut. Eggs 2-3 mm in diameter, mass 3/4 X 2 1/2 inches in size.

1 June — Calif.: Eldorado Co., Grass Lake (near Luttier Pass) 7800 ft.

Large DOR. Snow patches still on road. Large chorus of Hyla in meadow.

1953

22 Apr. — Calif.: Contra Costa Co., Lafayette Reservoir

Large ♀ atratus taken while sunning at 1030 hrs. on top of large pile of dry leaves and small branches. 6-8 feet from water. This is the only large Thamnophis seen by me during several years at Reservoir. Easy to capture, making no effort to escape. Weather cool and sunny.

1 May — Calif.: Sacramento Co., 6 mi. E Natoma, Sacramento-Eldorado line Co.

Single half-grown atratus with brilliant orange stripe ~~taken~~ taken at base of rock talus of road fill and adjacent to extensive rolling grassy plains. Nearest water in small 6 foot diameter and trickle through meadow about 200 ft. away. Only trees within 1/2 mile are one small willow several yards away and 3 oaks ~~300 yds~~ 500 ft. away.

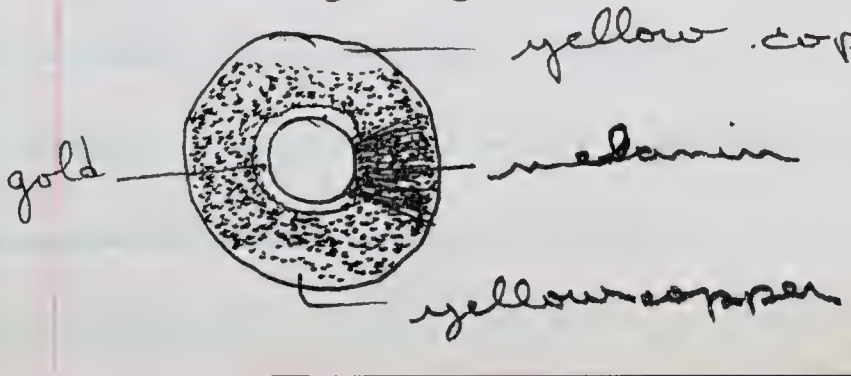
W. Reiner
1949

Thamnophis eques

16 July Arizona, Santa Cruz Co., Peña Blanca Springs

Very young specimen, perhaps newly born taken while crossing trail attempting to escape to cover of bush at corner of covered well near corral in sight of campground. 1815 hours in well shaded situation. Shadows long and sun low over hills. Temp. still warm. Had light rains during mid-afternoon. Watering trough close by and seepage area 100 ft or so away. Not difficult to catch.

299, newborn, colors in life; venter white with greenish tint at base of tail. Top of head olive-gray lateral stripes cream on neck rapidly changing to pinkish-milk. Dorsal stripe intense orange between and just behind ~~nuchal~~ postoral blotches grading to buffy cream. Anteriorly skin of dorsal area light green and black checkerboard pattern; two rows of squares on each side dorsal stripe. Generally, scales give irregularly olive and black pattern. Posteriorly dorsum dark olive-gray.



W. Riemer
1949

Thamnophis eques

18 July Arizona, Santa Cruz Co., 0.5 mi. SW Yanks Spring Sycamore Canyon 1/1
One taken at edge of grassy area at edge of marshy portion of stream about 1/2 mi. below Yank Springs. 1115 hours. Warm but though sunny, slightly overcast. In bottom of canyon with considerable rock and rocky outcrops about, extensive grass, scattered large trees. Had had heavy rains on previous day and night. Pool within dozen feet with many fish, Rana pipiens and tarahumarae adults.

1 Aug. New Mexico, Co., 1 mi. above X S X Ranch, E. Fork Gila River One specimen taken at edge of pool resulting from hot spring in front of buildings of American Iron and Machine Works. Spring about 50 feet from river and with temperature of 40.3° C. Mud in bottom of pool 42.0°C R. pipiens numerous along bank.
#409 A, young, colors in life; venter and ventral surface tail white with pale gray generally but indistinct stripe of greenish gray medially and faint tinge of pink-lavender at ends of gastrosteges. Throat and labials pale salmon. Chin centrally almost white. Top of head olive-black. Nuchal patches black. Skin of

W. Riemer
1949

Thamnophis eques

1 Aug. New Mexico, Co., 1 mi. above X SX Ranch, E. Fork Gila River (#409 A cont'd.) dorsum roughly patterned in squares black and bright, light green yellow on anterior 4 inches the green rapidly changing to snowy white posteriorly. Scales of dark stripes of dorsum deep, dark brown. Dorsal stripe bright orange on neck grading to buff ~~by at~~ mid-body. Lateral stripe green – yellow on ~~t~~ neck grading to whitish ~~by~~ vent. Tongue black on distal half, proximally bright red.

W. Riemer
1953

Thamnophis eques

2 July Mexico: Chihuahua: 7 mi. SW El Vergel (=Lagunita), 7800 ft.

1982. Chin white. Belly very pale bluish grey. Dorso-lateral skin black and white even on neck. Vertebral stripe dirty cream entire length. Dorso-lateral scales tan (especially the keels) and black. Iris dark tan with blackish suffusion midway between periphery and pupil, and complete golden pupillary ring. Top of head brownish grey. Tongue red with black distal half.

6 July Mexico: Durango: Rio Florido at ~~Cantill~~ Cantillo, 6100 ft.

2021, 2022. Young. Venter ~~with slight~~ milk color. Dorsum tan with black spots, skin black with white spots. Dorsal stripe yellow cream in 2022, buff cream in 2021. Iris reddish gold with gold pupillary ring. Tongue red with black distal portion to behind fork.

7 July Mexico: Durango: 33 mi. ENE El Salto, 7200 ft.

Single newborn taken. Tongue white at base, bright red middle and distal ⅓-½ black.

W. Riemer
1953

Thamnophis ~~sp.~~ errans

28 June Mexico: Chihuahua: 7 mi. SW El Vergel (= Laguinitas), 7800 ft.
Single adult taken while crossing dirt road 75 ft. from stream at dusk. Venter light cream on chin becoming salmon-grey on belly. Vertebral stripe greyish-cream.

2 July #1979. Chin white. Venter greenish-grey. Vertebral stripe creamish-grey. Top of head olive grey. Iris dark brown with almost complete, golden ~~pupil~~ pupillary ring. Tongue totally black. Disgorged several small post-larval toads which are locally very abundant.

8 July Mexico: Durango: 6 mi. WSW Las Adjuntas, 8500 ft.
#2042. Colors, freshly killed: Vertebral stripe pale lemon. Dorsum black and deep olive-grey. Skin black and white with slight greenish tinge ~~to~~ white on neck. Chin milk, grading to light ~~greyish-green~~ greenish-grey at mid body but with pale rusty tinge. Iris black with incomplete pupillary ring of gold. Tongue black ~~&~~ except for deep red on proximal 1/4.

W. Reiner
1949

Thamnophis marcianus

21 July Arizona, Cochise Co., Fry

Two very young specimens taken together under small boulder only partially resting on ground. Within 6 ft. of water. Thin green stand of grass margining pond. Pond 100 ft. by 15 ft. Sun just ready to set, 1700 hours, comfortably cool. Two larger adult specimens taken under water at bases of rocks projecting above water surface. One disgorged large number tadpoles which were very abundant in pond. Young R. pipiens also present in numbers. Several addition young snakes taken in vicinity mostly under boards or stones. #352, ~~venter~~ colors in life, young; venter posterior to throat greenish including tail, throat and chin milk, dorsal stripe buffy-cream, lateral stripes milk with touch of pinkish, Ground color of dorsum brownish olive, small specks of tan in dorsal black spots. Skin between anterior black spots pale green. Nuchal blotches black with tannish centrally. Top of head brownish-olive. Iris reddish copper. Tongue red with black tip.

W. Riemer
1947

Thamnophis ordinoides elegans

200 yds. W. Old Station, Shasta Co., Calif.

9 Aug. Two specimens taken at edge of water in rapidly flowing irigation channel near highway. Habitat: Grassy banks along channel with surroundings bare and dry except for scattered conifers. At least one of the specimens regurgitated a number of small dark slugs.

D. Rieser
1948

Thamnophis ordinoides atratus

1.

23 Apr. Berkeley Hills, Alameda Co., Calif. Individual taken crossing road at head of Panoramic Way. Time: about 1400. Weather: warm and sunny. (Orange stripe phase. See 28 April)

24 Apr. Wildcat Canyon, Tilden Park, Contra Costa Co., Calif. Large individual captured in grass near Jewel Lake. Released.

28 Apr. Brought to my attention by Wade Fox that specimen (1. taken 23 Apr. '48, one of few of this sort taken in East Bay area. Believed by him to be a different species. Dorsal stripe orange. Lateral stripes greenish-gray. No red on body as is typical of atratus. Thought also to be a more aquatic type than atratus. Presented to Fox for use in taxonomic study.

5 May Berkeley Hills, Alameda Co., Calif. Another "orange stripe" taken in Sceloporus o. occidentalis study area 0900. Small individual (about 18"). Area on ridge covered with green grasses, thistle, scattered Baccharis, lumber and tar-paper. Conifer stand and chaparral nearby. Seems to be somewhat removed from aquatic environment. Nearest permanent water in Strawberry Creek at least ½ mile distant and

1948 Thanno phis ordinoides atratus 2.

5 May Berkeley Hills, Alameda Co., Calif.
hundreds of feet lower.

W. Riemer
1948

Thamnophis ordinoides couchii

28 June — Tenaya Creek, 4125 ft., 0.5 mi. above Mirror Lake, Yosemite Valley, Mariposa Co., Calif.
Two adults taken. # 80-81. One, crawling near edge of stream had just recently eaten. Forced to regurgitate a 5 in.± "brook" trout. Second one seen first swimming in water and captured as it reached bank.

29 June — Tenaya Creek, 0.8 mi. above Mirror Lake, 4145 ft., Yosemite Valley, Mariposa Co., Calif.
82 taken on sandy deposit near edge of stream.

Tenaya Canyon, 0.5 mi. above Mirror Lake, 4125 ft., Mariposa Co., Calif.

2 July — # 85 taken in pine, incense cedar, black oak association short ways from Tenaya Creek.

W. Riemer
1953

Thamnophis rufipunctatus

24 June Mexico: Chihuahua: Rio Papigochic, Miñaca, 6300 ft.

A single adult taken while hiding under rock in shallow water of quiet portion of main stream at dusk. All taken by Zweifel at midday on 25 June under rocks next to stream in lethargic condition. Is this species crepuscular and T. eques (also present) the diurnal form? Venter cream-yellow with black specks. Dorsum slate gray with diffuse rust-colored spots.

2 July Mexico: Chihuahua: 7 mi. SW El Vergel (=Chaguita), 7800 ft.

1980-1981. Chins white. Belly pale gray with greenish tinge medially in #1980. Dorsums brownish gray with brown blotches margined with black. Dorsum of #1981 more grayish than brown. Tongue brownish tan. Iris tan with blackish centrally and complete gold pupillary ring.

7 July Mexico: Durango: 33 mi. ENE El Salto, 7200 ft.

Single large adult taken coiled next to log few feet from stream. Dorsal pattern obsolete when dry giving uniform dull dark slate gray. Venter rich cream on chin grading to gray at mid body with strong admixture of deep green medially. Iris deep brown with muddy gold pupillary ring. Tongue deep red proximally and grayish brown distally.

J. Riemer
1948

Thamnophis sirtalis infernalis

1.

8 May

Walnut (?) Creek, 1 mi. WNW Concord, Contra Costa Co., Calif. #61 Color notes 21 May 1948. Comparisons with Ridgeway (1912), from freshly chloroformed animal. Top of head - Mahogany Red. Side of head - light Grape Green Chin - White. Posterior edge 5th supralabial with black speck. Iris - Buff Yellow. Pigment on iris very deep brown, thinnest at top, only narrow ~~unpigmented~~ ring about pupil unpigmented. Vertebral stripe - Buff Yellow at neck, Warm Buff at midbody, light Ochraceous Buff at vent. Lateral stripe - Straw Yellow at neck, Massicot Yellow at midbody, Sea-foam Yellow at vent. Ventral surface - Olive Buff at neck, Tea Green at midbody, same color continues to vent. Dorsal ground pattern of red with indistinct black bars. Both colors about equal in abundance. Red scales colored as follows: Anterior portion Scarlet changing to Morocco Red at posterior tip of each scale. Thought to be intergrade between infernalis and tetrataenia by Fox.

W. Reiner
1953

Thamnophis sirtalis

23 Mar. Calif: Calaveras Co., Angels Creek, ½ mi. S, 1¼ mi. W Murphys

Half-grown fitchi resting coiled in sunny patch of grass at edge of stream. Cool. Made no effort to escape though almost stepped upon. Stream 8.8° C at 1030 hrs. Yellow pine abundant on canyon slopes, also oaks. Willows and alders by stream. Digger pine on ridges. Rana boylii common in stream.

30 Mar. Calif: Sonoma Co., Warm Springs Creek, ½ mi. N, 1 mi. W Skaggs Springs

Apparently frightened large specimen into stream on approach to bank. When first seen it was unsuccessfully swimming against full current in mid-stream. Brilliant red coloration makes it very easy to spot.

W. Reiner
1953

Trimorphodon paucimaculata

15 July Mexico: Sinaloa: 10 mi. N Mazatlan

2170. Taken on road at night. Warm. Dark of moon. No rain for 2 days. Colors, freshly killed. Dorsum yellow-grey, blotches almost same greyish yellow medially and changing to brown and then blackish anteriorly and posteriorly on each blotch. Head pattern rich tan blackish and greyish-yellow. Iris ~~tawny~~ greyish gold yellow.

Riemer, W. J.

1947-1954

Species Accounts

Mammal

W. Riemer
1949

Sorex

17 Aug. Colorado, Huerfano Co., 9.9 mi. NNW Aguilar, U.S. Hwy 85-87

Specimen found under one of many old planks lying on ground about abandoned house. Made no attempt at escape — probably blinded by light — and taken with hand. Killed by compression of thorax. Gently rolling short-grass prairie with many sunflowers in vicinity of house. Locust shrubs also in immediate vicinity. Soil dry and baked. Weather sunny, clear, cool. Associated animals: S. undulatus, Phrynosoma douglassii (all lizards).